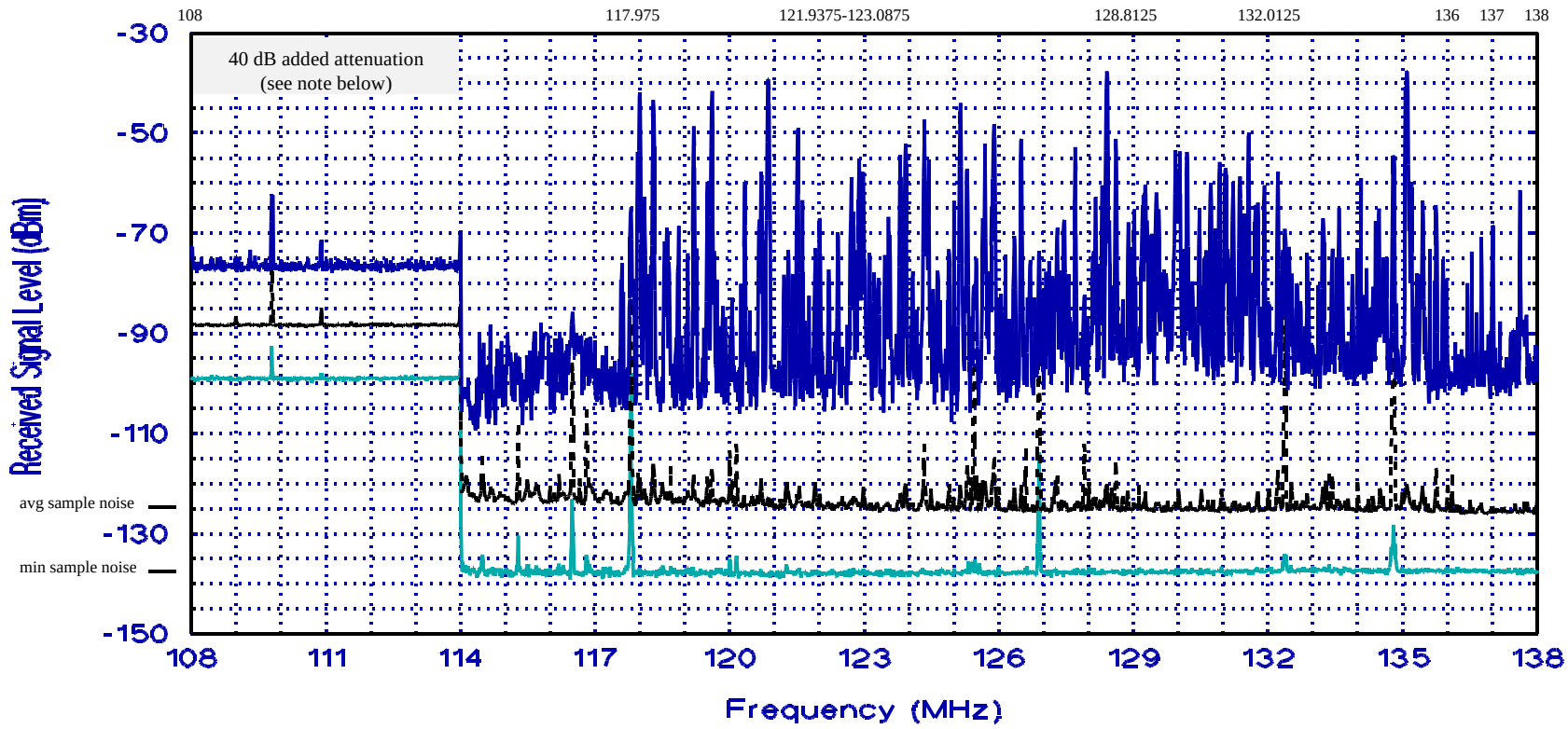
GOVERNMENT ALLOCATIONS:	AERONAUTICAL RADIONAVIGATION.	AERONAUTICAL MOBILE.		AERONAUTICAL MOBILE.		AERONAUTICAL MOBILE.		4.
NON-GOVERNMENT ALLOCATIONS:	AERONAUTICAL RADIONAVIGATION.	AERONAUTICAL MOBILE.	1.	AERONAUTICAL MOBILE.	3.	AERONAUTICAL MOBILE.	3.	4.
GENERAL UTILIZATION:	VHF Omnidirectional Range (VOR).	Air Traffic Control.	1.	Air Traffic Control (ATC). 2.		Air Traffic Control.		5.

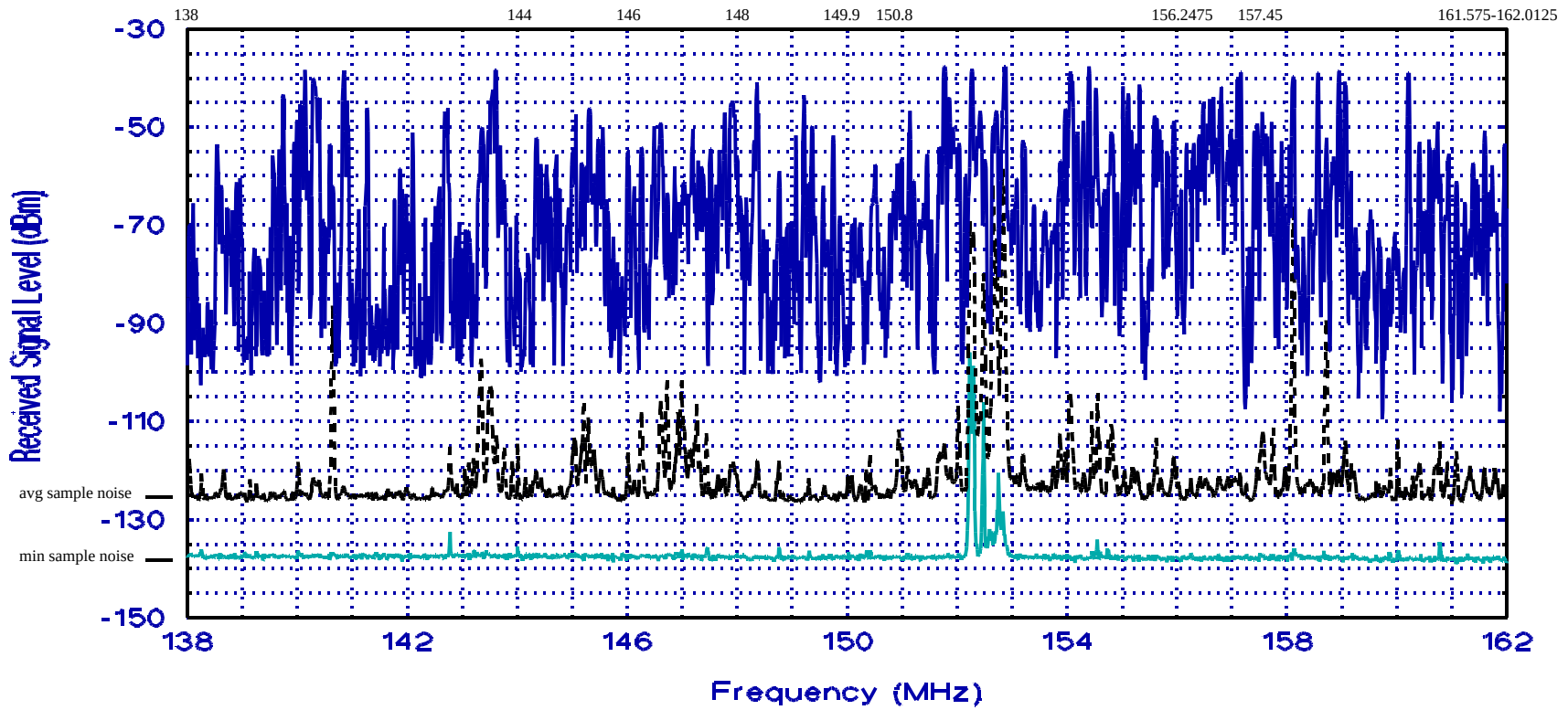


Note: Concerning 108-114 MHz attenuated data, see comments in Table 7 (Section 3.5.1).

1. AERONAUTICAL MOBILE. Private aircraft.
2. 123.1 MHz: SAR (search and rescue) operations.
3. AERONAUTICAL MOBILE.
4. SPACE OPERATION (space-to-Earth), METEOROLOGICAL-SATELLITE (space-to-Earth), SPACE RESEARCH (space-to-Earth), 137-137.025 MHz and 137.175-137.825 MHz: MOBILE-SATELLITE, 137.025-137.175 MHz and 137.825-138: Mobile-Satellite.
5. Government use includes TIROS downlinks; non-Government includes nongeostationary nonvoice mobile satellite systems (Little LEOS).

Figure 4. NTIA spectrum survey graph summarizing 7,000 sweeps across the 108-138 MHz range (System-1, band event 11, swept/m3 algorithm, sample detector, 10-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	FIXED, MOBILE.			FIXED, MOBILE, 3.	5,6.		8.			
NON-GOVERNMENT ALLOCATIONS:		AMATEUR, 2.	AMATEUR.	3.	5.	LAND MOBILE.	8.	LAND MOBILE.	9.	
GENERAL UTILIZATION:	Non-tactical military land mobile communications. 1.			4.	7.	Land transportation, public safety, industrial, Earth telecommand, etc.		Land transportation, public safety, industrial, etc.		

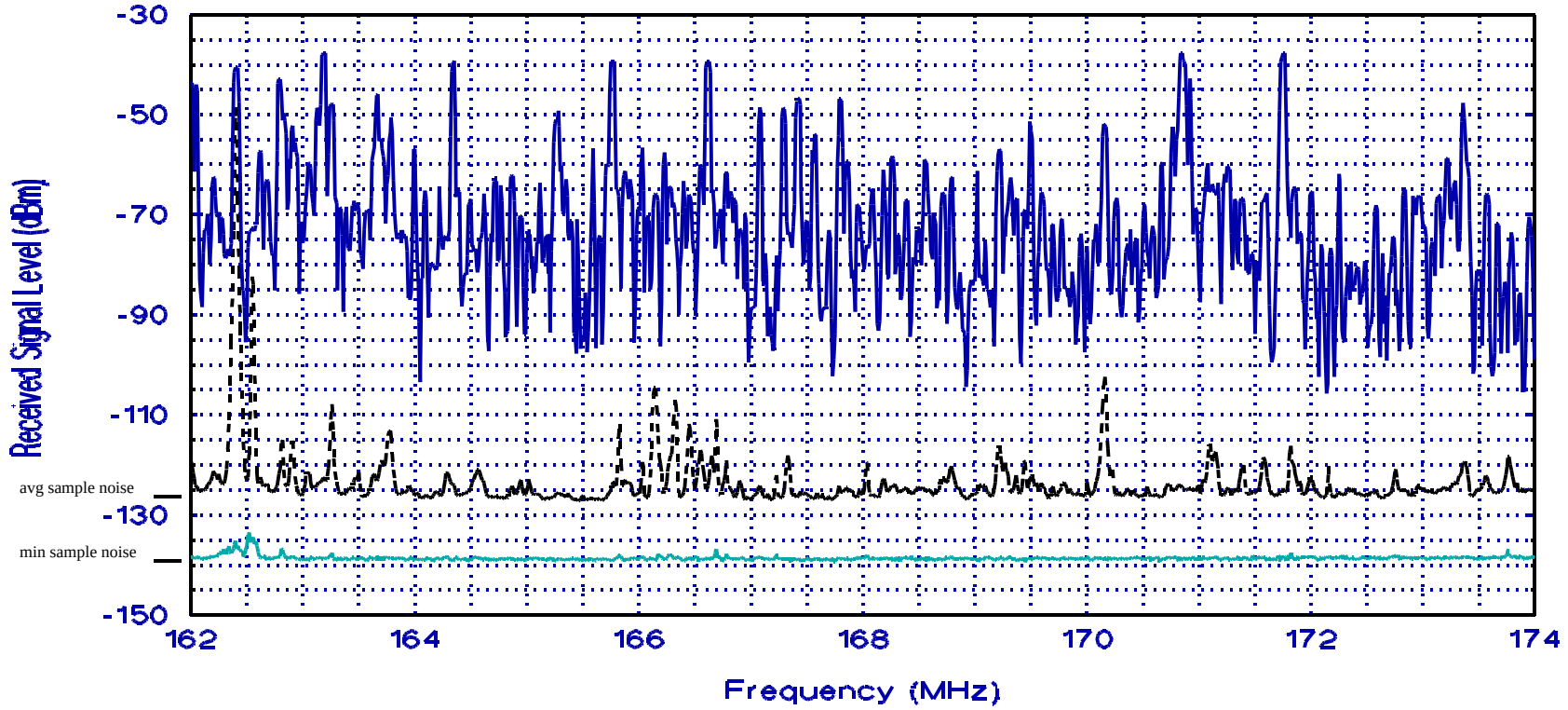


1. 143.75 MHz and 143.9 MHz: Civil Air Patrol.
2. AMATEUR-SATELLITE.
3. MOBILE-SATELLITE (Earth-to-space).
4. Non-tactical military land mobile communications. 148.15 MHz: Civil Air Patrol. Government use includes TIROS command links and NASA satellite operations. Non-Government use includes nongeostationary nonvoice mobile satellite systems (Little LEOS).
5. 149.9-150.05 MHz: RADIONAVIGATION-SATELLITE, MOBILE-SATELLITE (Earth-to-space).
6. 150.05-150.8 MHz: FIXED, MOBILE.
7. Government use includes military non-tactical mobile and fixed communications and TRANSIT-SAT downlinks. Non-Government use includes "Little LEOS."
8. MARITIME MOBILE. 157.0375-157.1875 MHz: Govt only, VHF distress systems communications.
9. MARITIME MOBILE. 161.625-161.775 MHz: LAND MOBILE.

Figure 5. NTIA spectrum survey graph summarizing 7,000 sweeps across the 138-162 MHz range (System-1, band event 11, swept/m3 algorithm, sample detector, 10-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	FIXED, MOBILE		3.
NON-GOVERNMENT ALLOCATIONS:		1.	
GENERAL UTILIZATION:	Land Mobile Radio (LMR) including weather radio, public safety, and law enforcement.	2.	

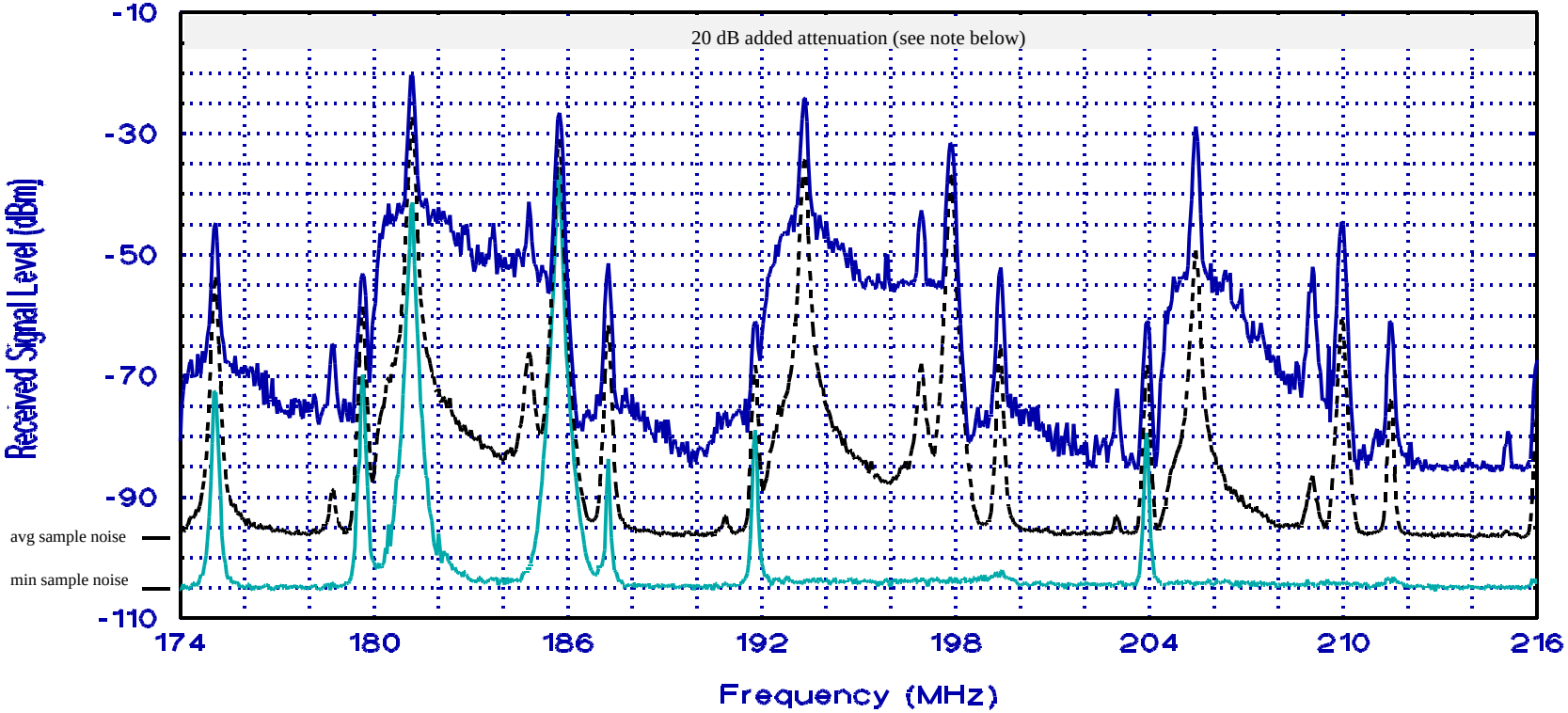
162.0125 173.2-173.4 174



1. FIXED, Land Mobile.
2. Industrial, public safety.
3. FIXED, MOBILE.

Figure 6. NTIA spectrum survey graph summarizing 52,500 sweeps across the 162-174 MHz range (System-1, Band Event 12, swept/m3 algorithm, sample detector, 10-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:								
NON-GOVERNMENT ALLOCATIONS:	BROADCASTING (television broadcasting), 1, 2.							
GENERAL UTILIZATION:	Channel 7	Channel 8	Channel 9	Channel 10	Channel 11	Channel 12	Channel 13	
	174	180	186	192	198	204	210	216



Note: Concerning 174-216 MHz attenuated data, see comments in Table 7 (Section 3.5.1).

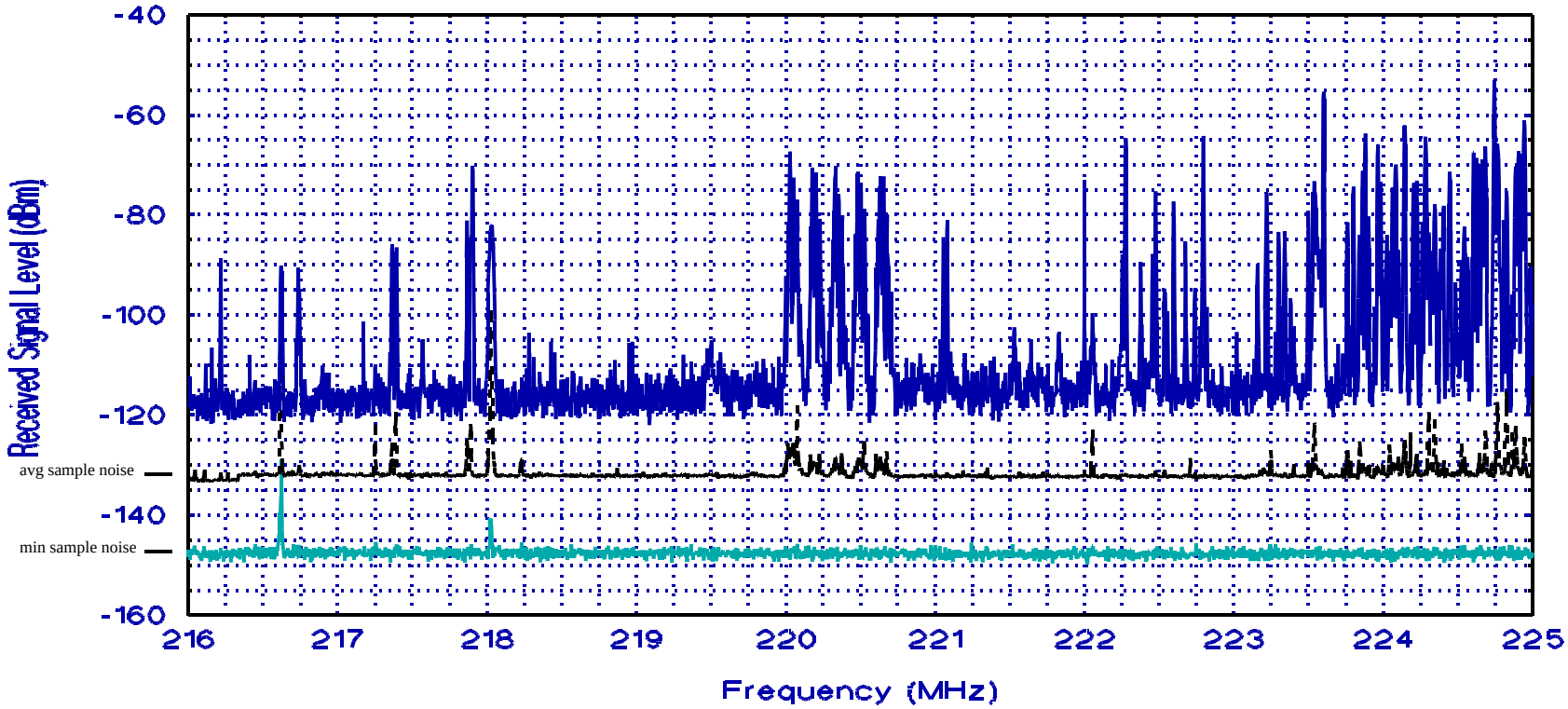
1. Subscription television services and limited wireless microphone operations are also permitted in this band.

2. TV broadcast licencees are permitted to use subcarriers on a secondary basis for both broadcast and non-broadcast purposes.

Figure 7. NTIA spectrum survey graph summarizing 18,500 sweeps across the 174-216 MHz range (System-1, band event 13, swept/m3 algorithm, sample detector, 100-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	MARITIME MOBILE, Radiolocation, Fixed, Aeronautical Mobile, 1, 2.	LAND MOBILE, Radiolocation, 1.	Radiolocation, 1.	
NON-GOVERNMENT ALLOCATIONS:	MARITIME MOBILE, Fixed, Radiolocation, Aeronautical Mobile, 2.	LAND MOBILE.	AMATEUR.	
GENERAL UTILIZATION:	Automated maritime telecommunications systems.	Trunked and conventional systems.	Amateur (1.25 meters).	

216 220 222 225



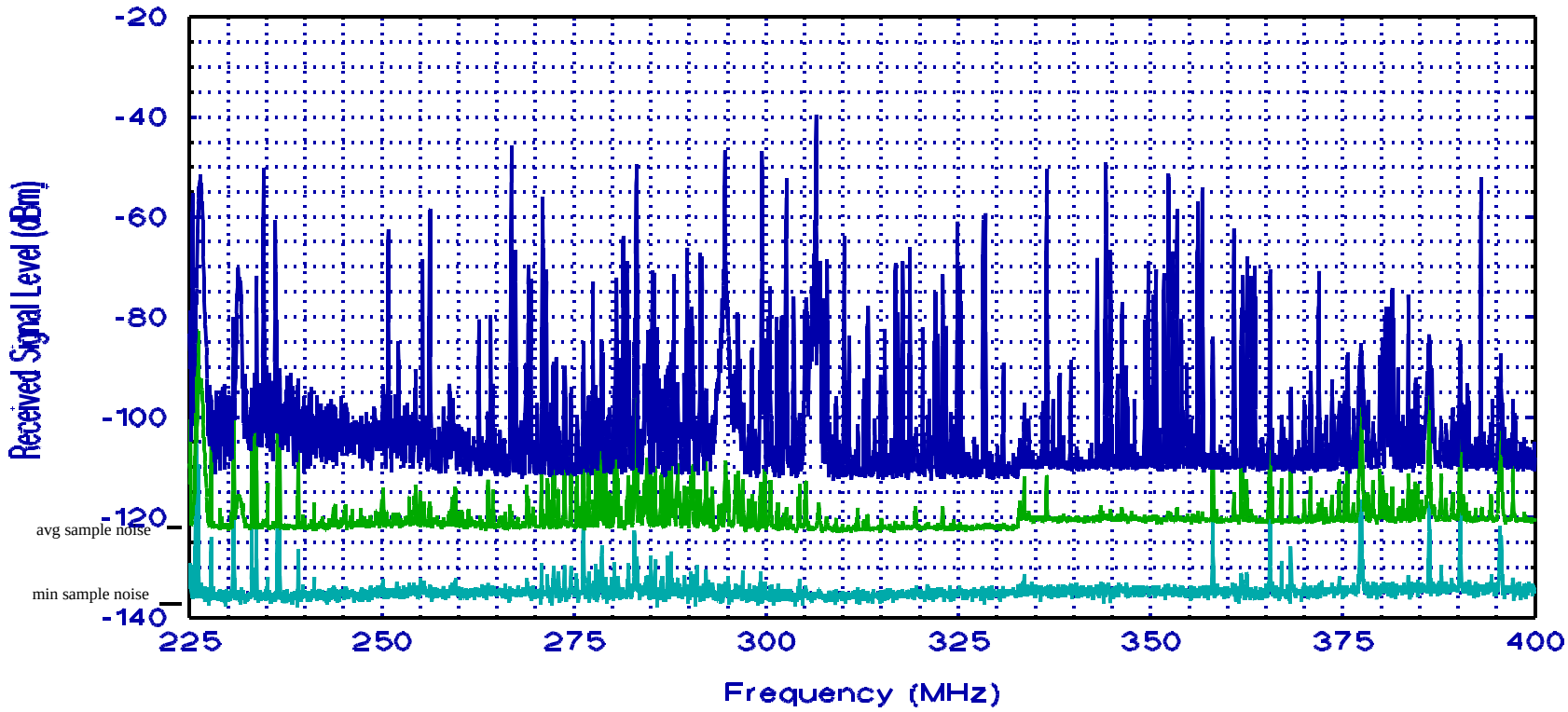
1. Radiolocation is limited to the military services.

2. Secondary services, other than radiolocation, are generally limited to telemetering and associated telecommand operations.

Figure 8. NTIA spectrum survey graph summarizing 4,020 sweeps across the 216-225 MHz range (System-1, band event 14, swept/m3 algorithm, sample detector, 3-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	FIXED, MOBILE, 1.	2.	FIXED, MOBILE, 3.
NON-GOVERNMENT ALLOCATIONS:		2.	3.
GENERAL UTILIZATION:	Military tactical and training communications including air traffic control (ATC).	2.	

225 328.6-335.4 400.05

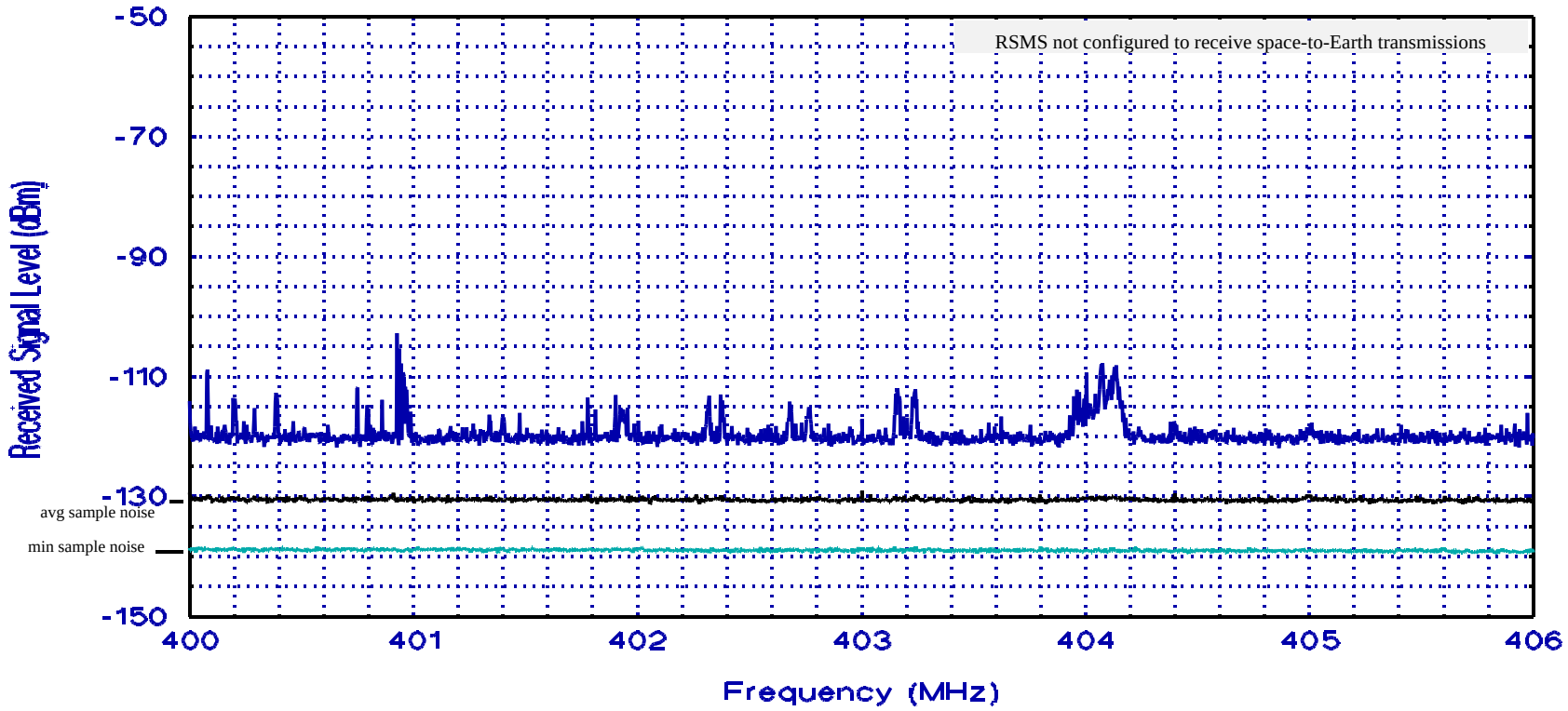


1. Government usage is limited to the military services; additionally, 235-322 MHz is allocated on a primary basis to the mobile-satellite service. 243.0 MHz may be used for search and rescue operations.
2. AERONAUTICAL RADIONAVIGATION, instrument landing systems (ILS) only.
3. 399.9-400.05 MHz: RADIONAVIGATION-SATELLITE, MOBILE-SATELLITE (Earth-to-space).

Figure 9. NTIA spectrum survey graph summarizing 2,900 sweeps across the 225-400 MHz range (System-1, band event 15, swept/m3 algorithm, sample detector, 30-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	1.	METEOROLOGICAL AIDS (Radiosonde), 2, 3, 4, 5.
NON-GOVERNMENT ALLOCATIONS:	1.	METEOROLOGICAL AIDS (Radiosonde), 3, 4, 5.
GENERAL UTILIZATION:	1.	Meteorological radiosondes and satellite communication including GOES and TIROS-N.

400.05-400.15 406

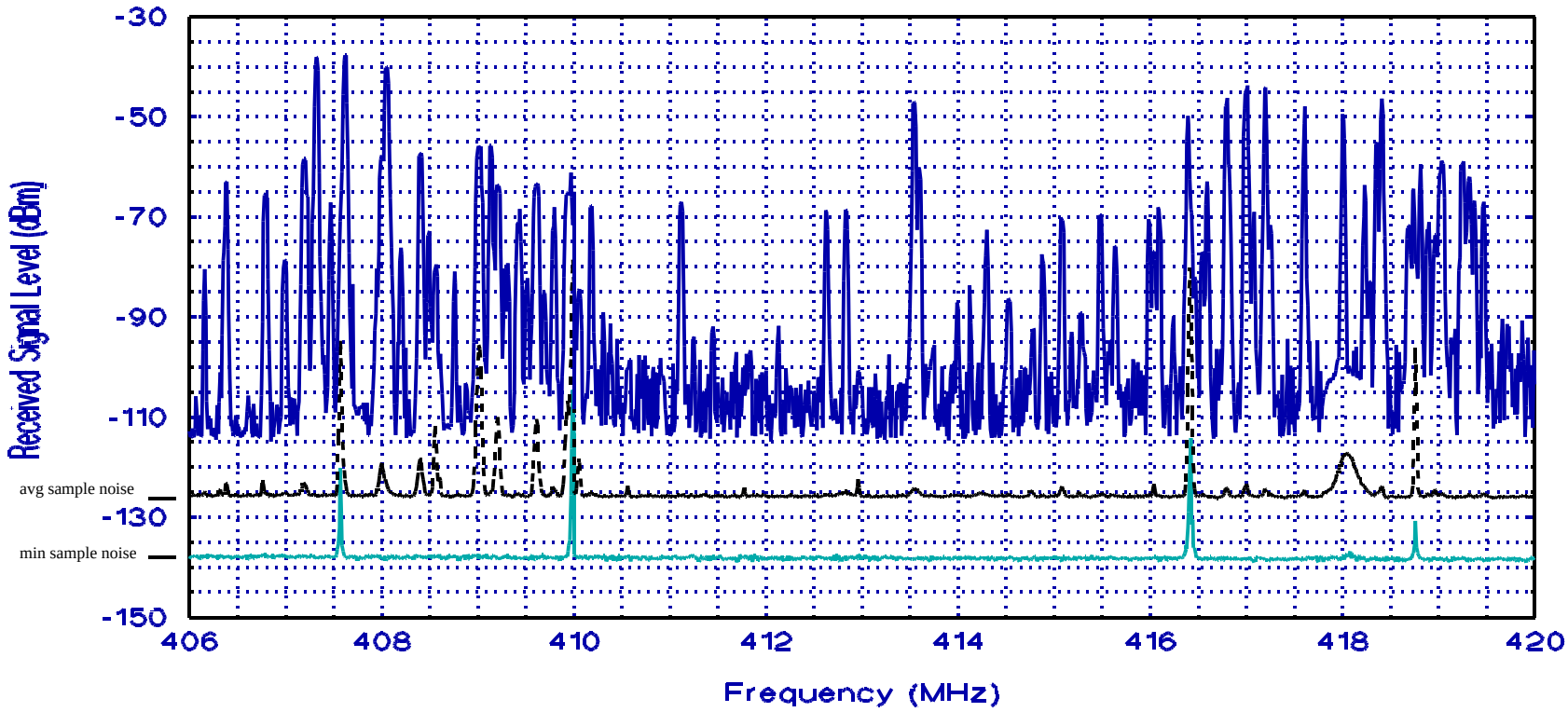


1. STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz ±25 kHz).
2. 400.15-401 MHz: METEOROLOGICAL-SATELLITE (space-to-Earth).
3. 400.15-401 MHz: SPACE RESEARCH (space-to-Earth), MOBILE-SATELLITE (space-to-Earth), Space Operation (space-to-Earth).
4. 401-402 MHz: SPACE OPERATION (space-to-Earth), Earth Exploration-Satellite (Earth-to-space), Meteorological-Satellite. (Earth-to-space).
5. 402-403 MHz: Earth Exploration-Satellite (Earth-to-space), Meteorological-Satellite (Earth-to-space).

Figure 10. NTIA spectrum survey graph summarizing 2,040 sweeps across the 400-406 MHz range (System-1, band event 16, swept/m3 algorithm, sample detector, 3-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	1	FIXED, MOBILE, RADIO ASTRONOMY, 2.	FIXED, MOBILE, Space Research (space-to-space), 2.
NON-GOVERNMENT ALLOCATIONS:	1	RADIO ASTRONOMY.	
GENERAL UTILIZATION:	1	LMR, 2.	LMR, 2.

406-406.1 410 420

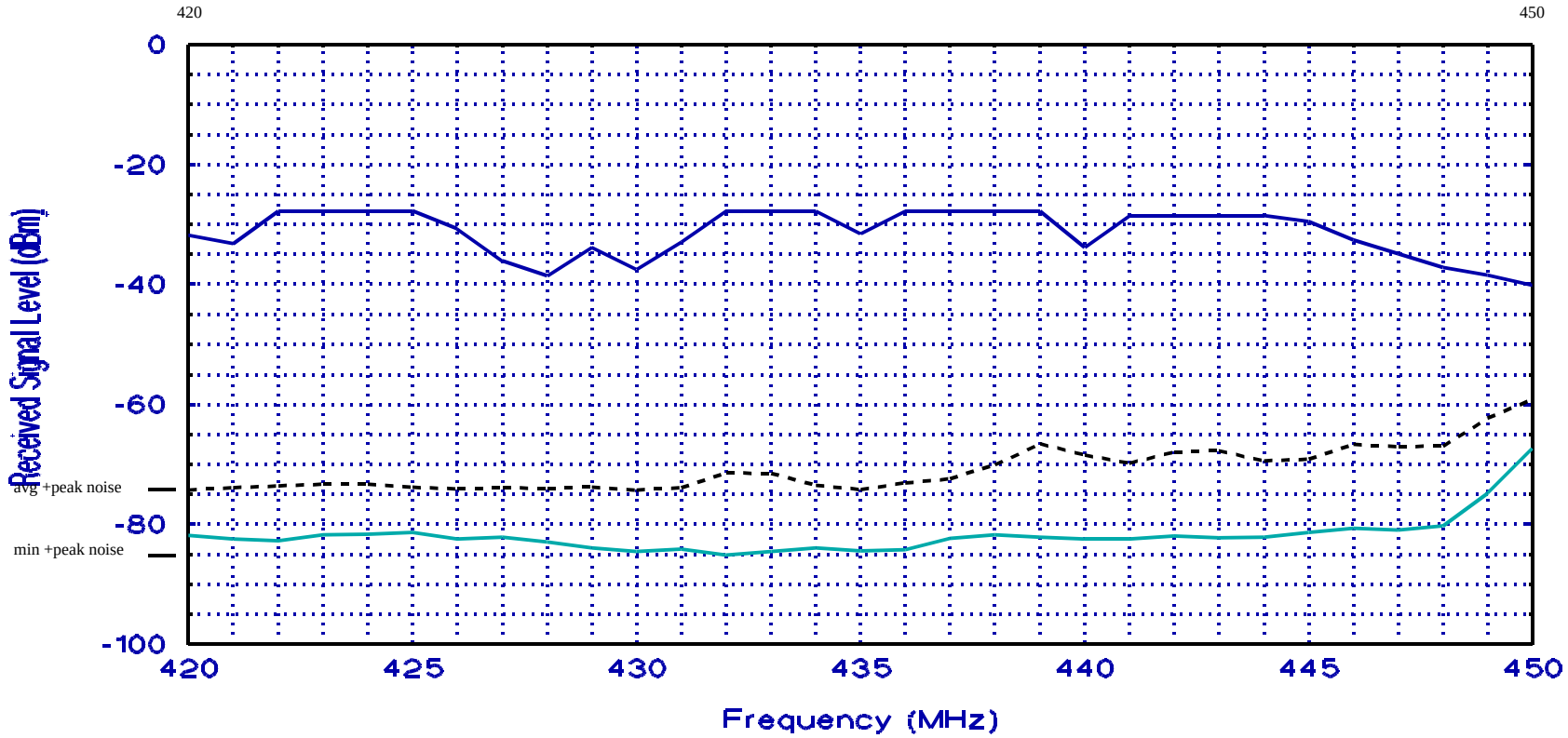


1. MOBILE-SATELLITE (Earth-to-space). Low power satellite emergency position-indicating radiobeacons (EPIRB) only. Supported by the joint U.S. SARSAT/Russian COSPAS satellite network.

2. Fixed and mobile services are allocated for Government nonmilitary agencies. Military use may be authorized on a local-coordinated, secondary, noninterfering basis.

Figure 11. NTIA spectrum survey graph summarizing 20,600 sweeps across the 406-420 MHz range (System-1, band event 17, swept/m3 algorithm, sample detector, 10-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	RADIOLOCATION.
NON-GOVERNMENT ALLOCATIONS:	Amateur.
GENERAL UTILIZATION:	Long-range surveillance radars, 1, 2.

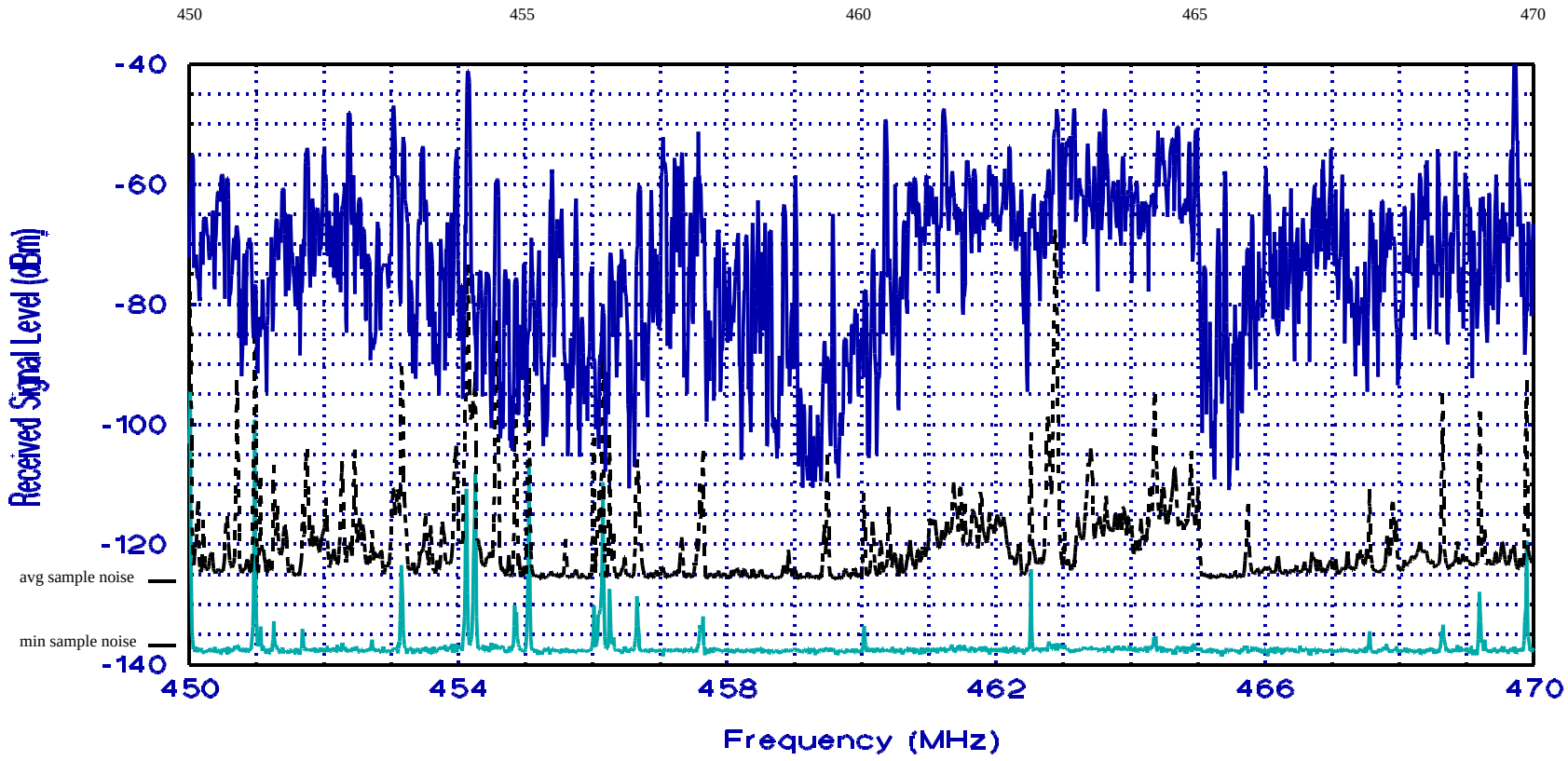


1. Radiolocation is limited to military services. Primarily, long-range radar systems essential to the nations early warning capability, law enforcement, and tracking objects in space. These systems use very high power and wide bandwidths. Low power radio control operations are permitted in the band. NASA and military use of telemetry and telecommand is also extensive.

2. There is some non-Government use of spread spectrum modes; also, amateur weak signal modes (432-433 MHz), television (420-432 & 438-444 MHz), repeaters (442-450 MHz), auxiliary links (433-435 MHz), and amateur satellite (435-438 MHz).

Figure 12. NTIA spectrum survey graph summarizing 68 scans across the 420-450 MHz range (System-1, band event 18, stepped algorithm, +peak detector, 1000-kHz bandwidth) at San Diego, CA, 1995.

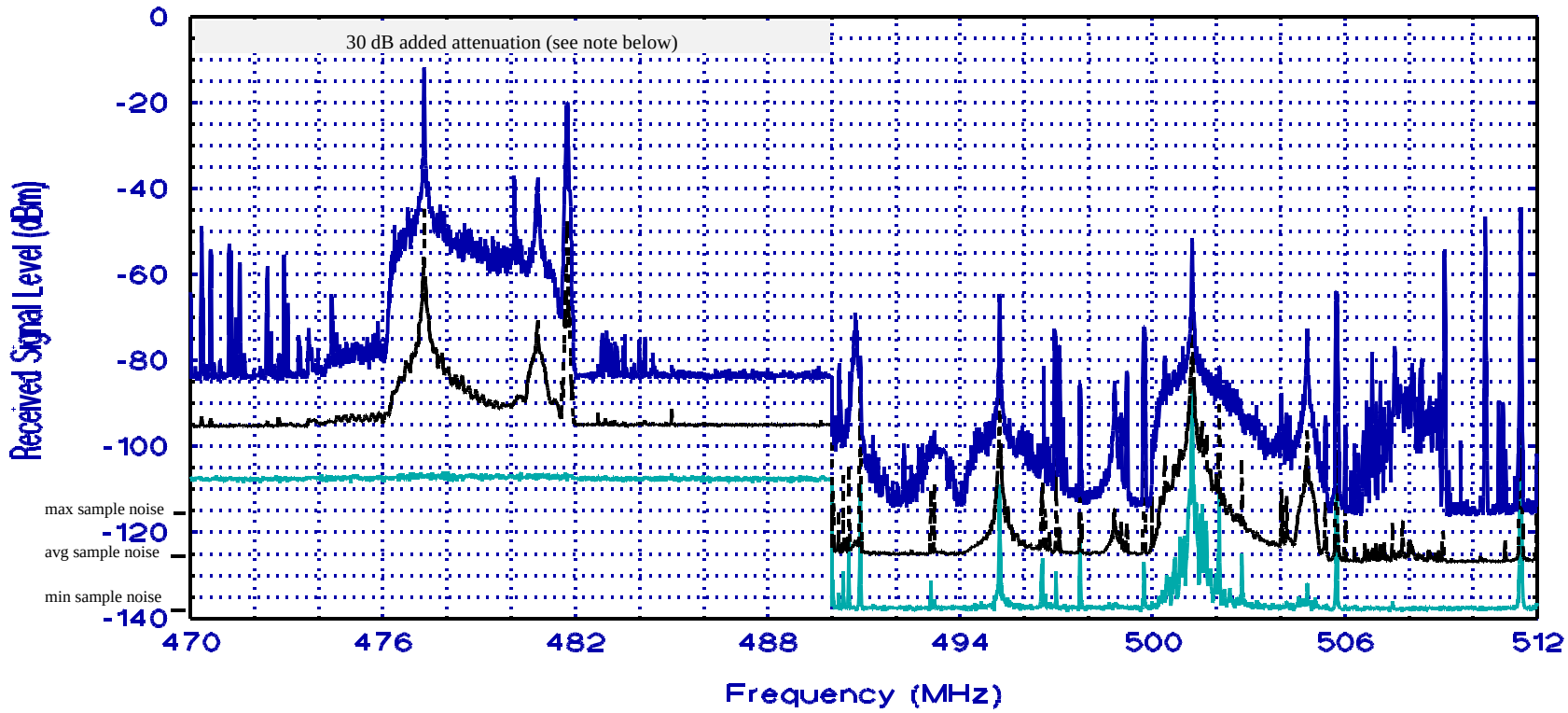
GOVERNMENT ALLOCATIONS:			Meteorological-Satellite (space-to-Earth).	
NON-GOVERNMENT ALLOCATIONS:	LAND MOBILE.		LAND MOBILE.	
GENERAL UTILIZATION:	LMR, 1, 2, 3. (base or mobile)	LMR, 1, 2, 3. (mobile only)	LMR, 2, 4, 5. (base or mobile)	LMR, 2, 4, 5. (mobile only)



1. 450-451 MHz and 455-456 MHz: Remote pickup broadcast.
2. 451-454 MHz, 456-459 MHz, 460-462.5375 MHz, 462.7375-467.5375 MHz, and 467.7375-470 MHz: Public Safety, Industrial, Land Transportation.
3. 454-455 MHz and 459-460 MHz: Domestic Public.
4. 462.5375-462.7375 MHz and 467.5375-467.7375 MHz: Personal.
5. 460-470 MHz: GOES and TIROS satellite downlinks.

Figure 13. NTIA spectrum survey graph summarizing 20,400 sweeps across the 450-470 MHz range (System-1, band event 19, swept/m3 algorithm, sample detector, 10-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:								
NON-GOVERNMENT ALLOCATIONS:	BROADCASTING, LAND MOBILE, 1, 2.							
GENERAL UTILIZATION:	Channel 14	Channel 15	Channel 16	Channel 17	Channel 18	Channel 19	Channel 20	
	470	476	482	488	494	500	506	512



Note: Concerning 470-490 MHz attenuated data, see comments in Table 7 (Section 3.5.1).

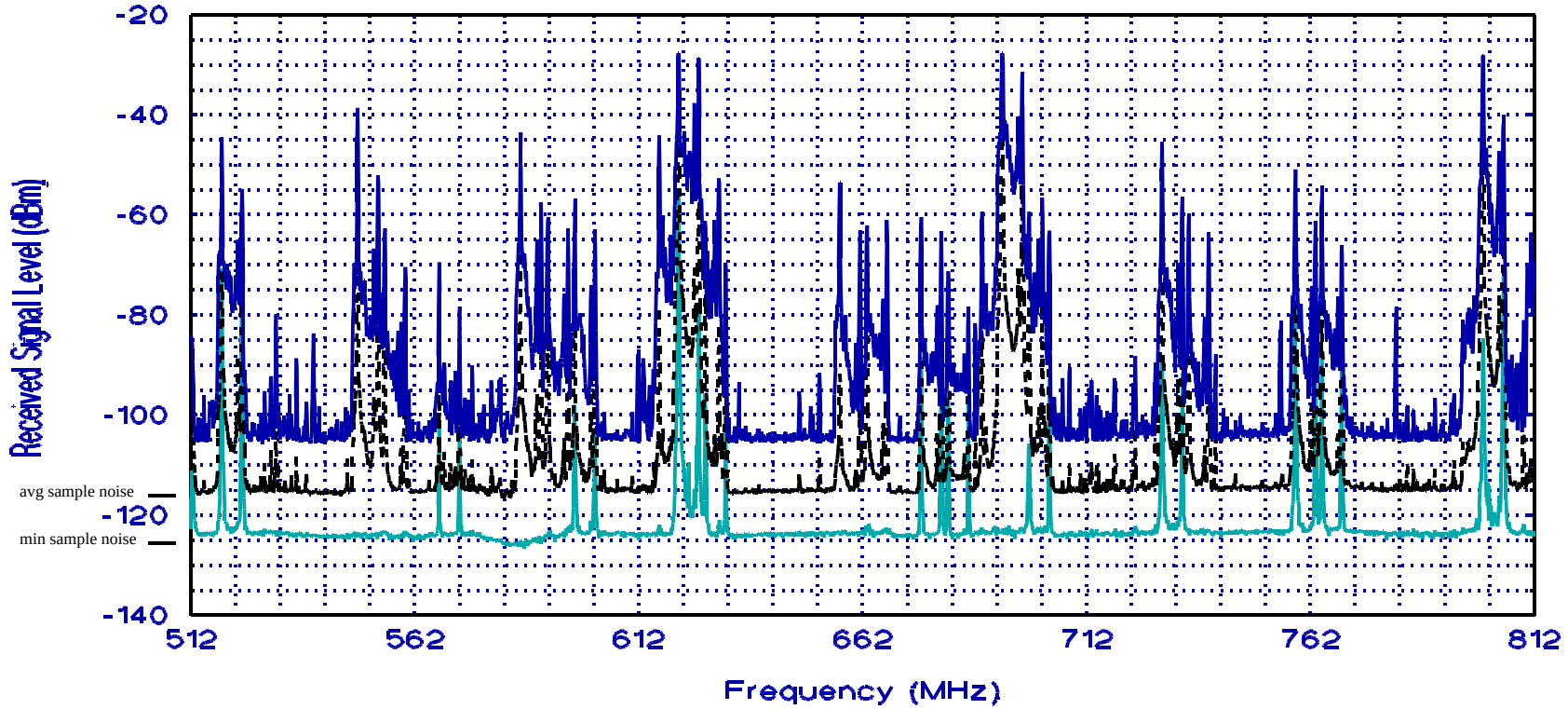
1. Land Mobile Radio Services include Public Safety, Domestic Public, Industrial, and Land Transportation assignments in specific urban areas.

2. The band is also allocated to the fixed service to permit subscription television operations.

Figure 14. NTIA spectrum survey graph summarizing 9,600 sweeps across the 470-512 MHz range (System-1, band event 20, swept/m3 algorithm, sample detector, 10-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:		1.	
NON-GOVERNMENT ALLOCATIONS:	BROADCASTING.	1.	BROADCASTING.
GENERAL UTILIZATION:	Television broadcasting (channels 21-36).		Television broadcasting (channels 38-69).

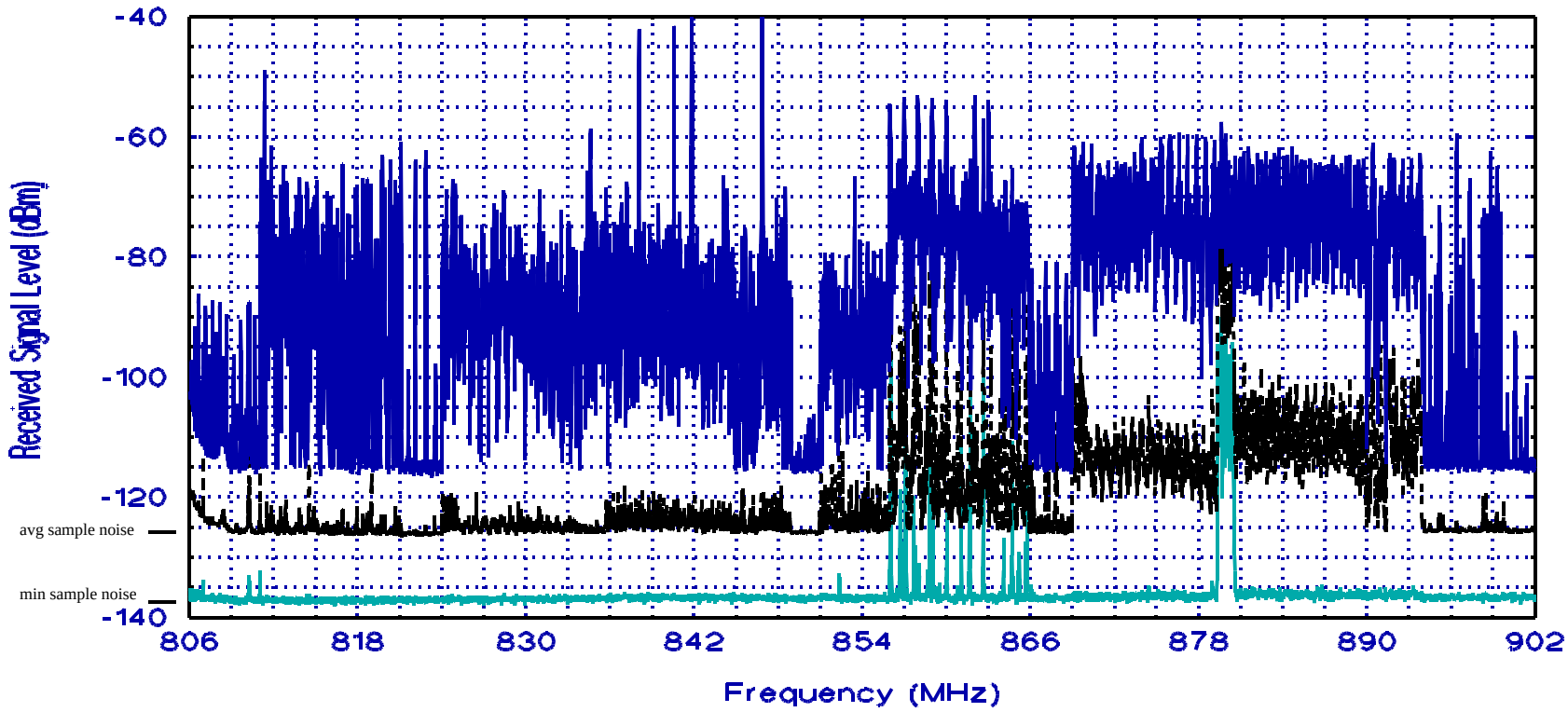
512 608-614 806



1. RADIO ASTRONOMY. No stations are authorized to transmit in this band.

Figure 15. NTIA spectrum survey graph summarizing 5,800 sweeps across the 512-806 MHz range (System-1, band event 21, swept/m3 algorithm, sample detector, 100-kHz bandwidth) at San Diego, CA, 1995.

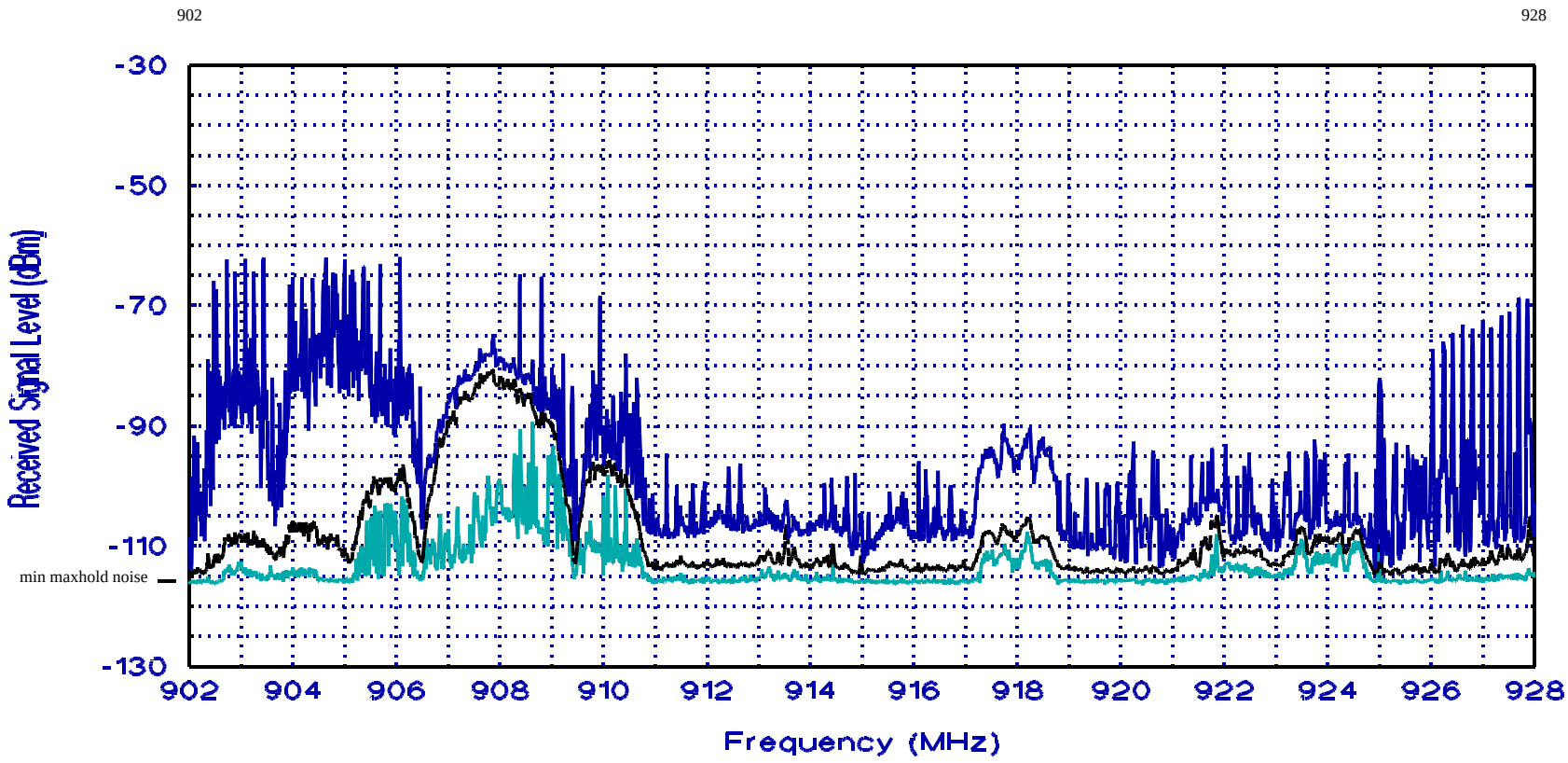
GOVERNMENT ALLOCATIONS:													
NON-GOVERNMENT ALLOCATIONS:	LAND MOBILE, 1.												
GENERAL UTILIZATION:	Conventional and Trunked (mobile).	2.	Cellular Systems (Public Mobile).	4.	Conventional and Trunked (base).	3.	Cellular Systems (Public Base).	5.	6, 7.				
	806	821	824	849-851		866	869			894	896		902



1. 806-890 MHz: Limited allocation is available for TV Channels 70-83.
2. Public Safety (mobile).
3. Public Safety (base).
4. Aeronautical Mobile (ground-to-air).
5. Aeronautical Mobile (air-to-ground).
6. 896-901 MHz: Private Land Mobile (paired with 935-940 MHz).
7. 901-902 MHz: General Mobile.

Figure 16. NTIA spectrum survey graph summarizing 4,020 sweeps across the 806-902 MHz range (System-1, band event 22, swept/m3 algorithm, sample detector, 10-kHz bandwidth) at San Diego, CA, 1995.

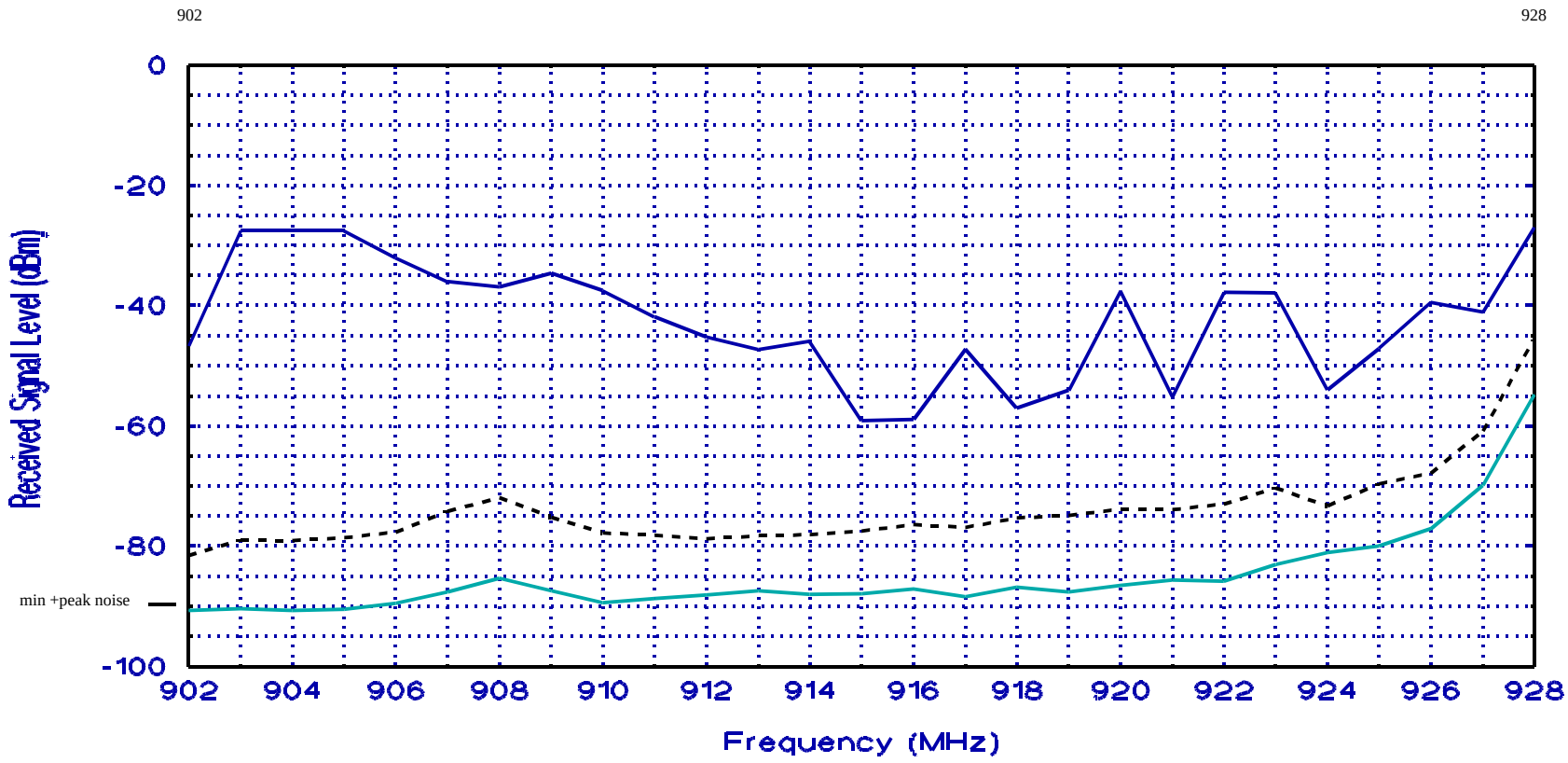
GOVERNMENT ALLOCATIONS:	RADIOLOCATION.
NON-GOVERNMENT ALLOCATIONS:	
GENERAL UTILIZATION:	Military radiolocation systems, Industrial scientific and medical (ISM), Automatic Vehicle Monitoring (AVM), spread spectrum devices, microwave ovens, digital communications, repeaters, 1.



1. Fixed and mobile radio services are permitted on a secondary basis; however, band utilization is increasing for non-Government ISM, spread spectrum and other modes, amateur, etc., as permitted in Region 2.

Figure 17. NTIA spectrum survey graph summarizing 16,800 sweeps across the 902-928 MHz range (System-1, band event 23, swept algorithm, maximum-hold detector, 10-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	RADIOLOCATION.
NON-GOVERNMENT ALLOCATIONS:	
GENERAL UTILIZATION:	Military radiolocation systems, Industrial scientific and medical (ISM), Automatic Vehicle Monitoring (AVM), spread spectrum devices, microwave ovens, digital communications, repeaters, 1.

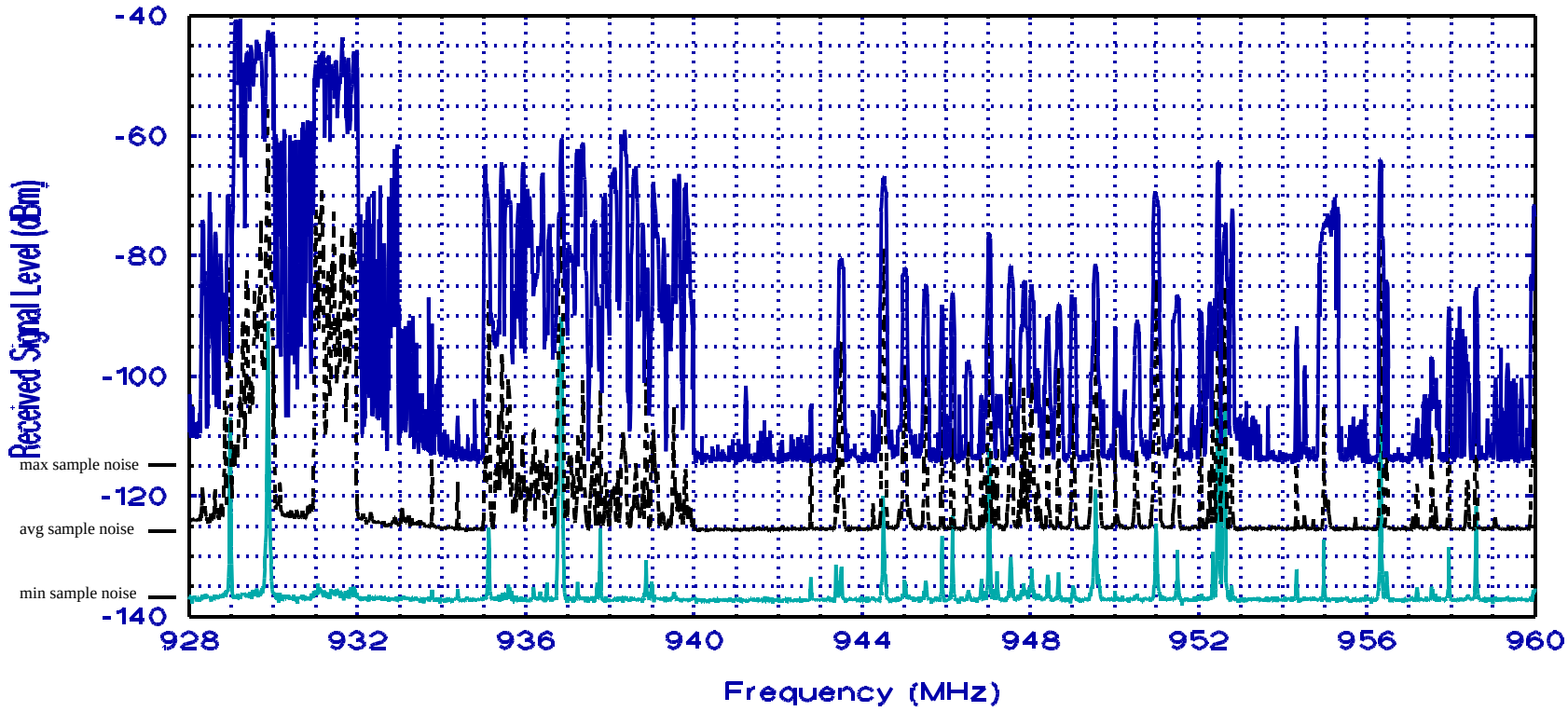


1. Fixed and mobile radio services are permitted on a secondary basis; however, band utilization is increasing for non-Government ISM, spread spectrum and other modes, amateur, etc., as permitted in Region 2.

Figure 18. NTIA spectrum survey graph summarizing 63 scans across the 902-928 MHz range (System-1, band event 24, stepped algorithm, +peak detector, 1000-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:			FIXED.			FIXED.	
NON-GOVERNMENT ALLOCATIONS:	1.	LAND MOBILE	FIXED.	LAND MOBILE.	5.	FIXED.	FIXED.
GENERAL UTILIZATION:	1.	2.	3.	Private land mobile (base), 4.		3.	Auxiliary broadcasting, private fixed microwave, studio-to-transmitter links (STL's), 6.

928 929 932 935 940 941 944 960

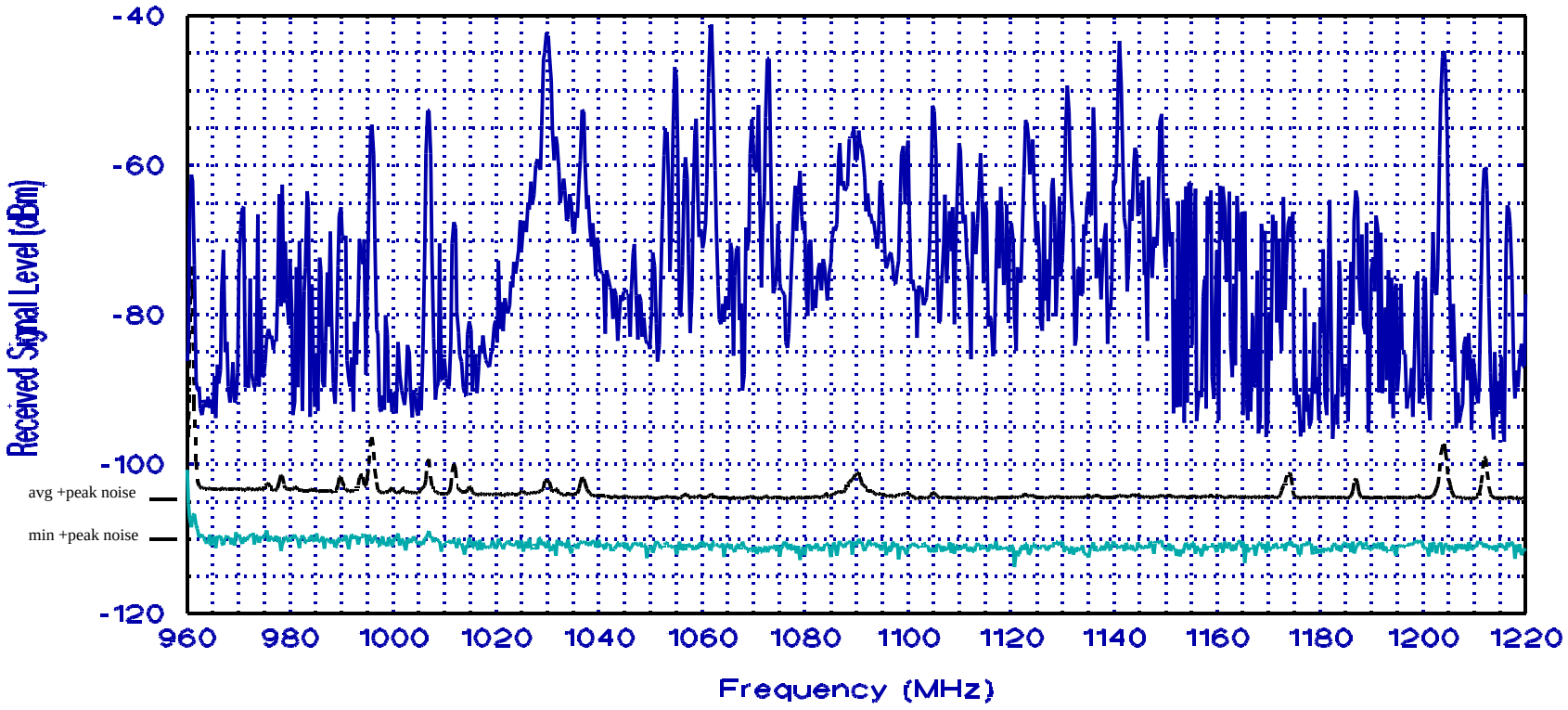


1. FIXED. Private fixed microwave, public and private land mobile, telemetry applications. Two-way services paired with 952-953 MHz.
2. Public and private land mobile.
3. Paired band for point-to-point and point-to-multipoint communications.
4. Trunked and conventional systems in 12.5 kHz channels (paired with 896-901 MHz).
5. MOBILE.
6. 944-952 MHz: Primarily STL's. 952-953 MHz paired with 928-929 MHz. 953-960 MHz: Primarily, fixed point-to-point communications.

Figure 19. NTIA spectrum survey graph summarizing 27,600 sweeps across the 928-960 MHz range (System-1, band event 25, swept/m3 algorithm, sample detector, 10-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	AERONAUTICAL RADIONAVIGATION, 1.	
NON-GOVERNMENT ALLOCATIONS:	AERONAUTICAL RADIONAVIGATION, 1.	
GENERAL UTILIZATION:	TACAN, DME, MLS, ATCRBS, MODE-S, T-CAS, JTIDS, 2.	

960 1215



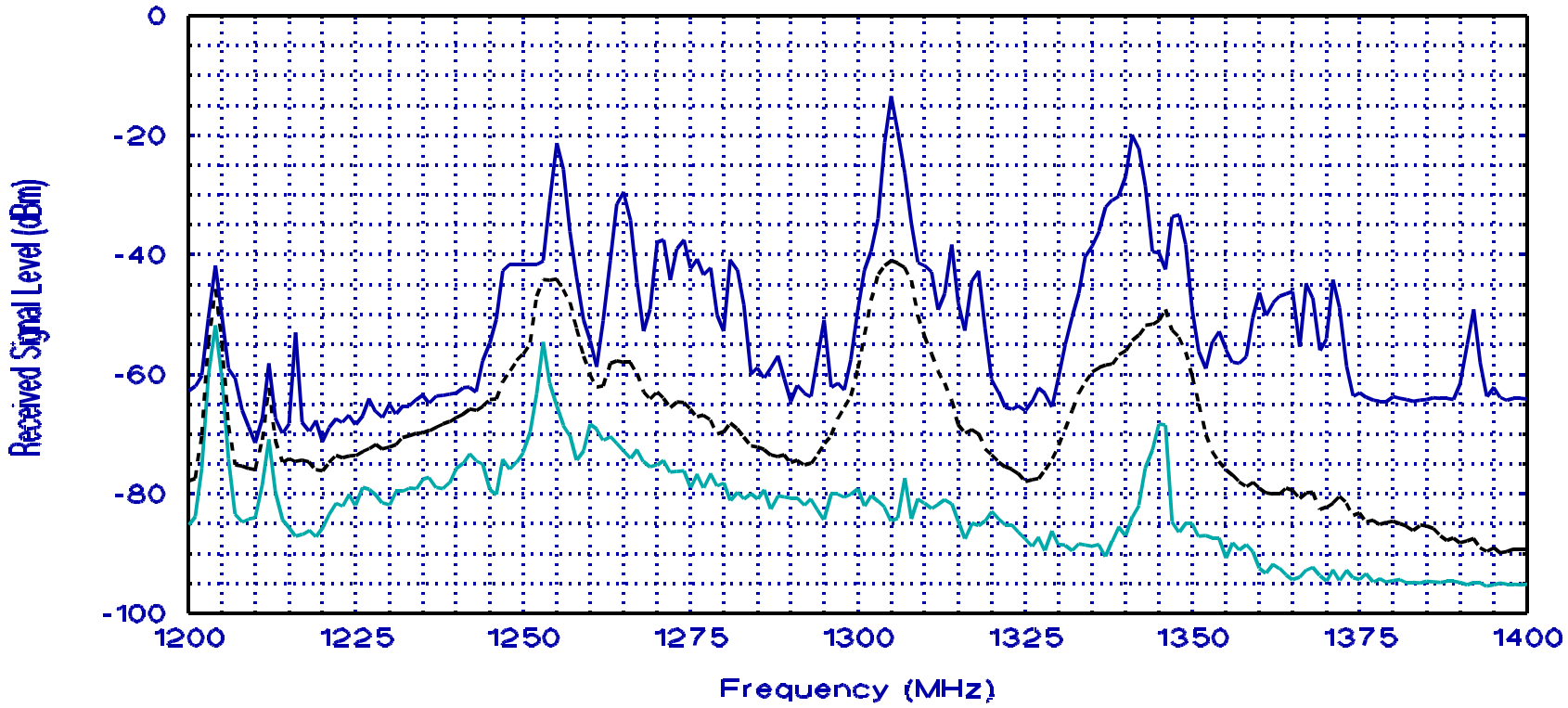
1. The 960-1215 MHz band is reserved on a worldwide basis for the use and development of electronic aids to air navigation. On a case by case basis, Government systems utilizing spread spectrum techniques for terrestrial communication, navigation and identification may be authorized on condition that aeronautical radionavigation services not experience harmful interference.

2. Tactical Air Navigation (TACAN). Distance Metering Equipment (DME). Microwave Landing System (MLS). Air Traffic Control Radar Beacon system (ATCRBS, MODE-S, and IFF). Collision Avoidance System (T-CAS). Joint Tactical Information Distribution System (JTIDS).

Figure 20. NTIA spectrum survey graph summarizing 36,500 sweeps across the 960-1215 MHz range (System-2, band event 05, swept/m3 algorithm, +peak detector, 300-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	RADIOLOCATION, 1.	RADIOLOCATION.	AERONAUTICAL RADIONAVIGATION, Radiolocation.	FIXED, MOBILE, RADIOLOCATION.	
NON-GOVERNMENT ALLOCATIONS:		Amateur.	AERONAUTICAL RADIONAVIGATION.		
GENERAL UTILIZATION:	2, 3, 4.	3, 4, 5.	3, 4.	3, 6, Fixed and Mobile links.	

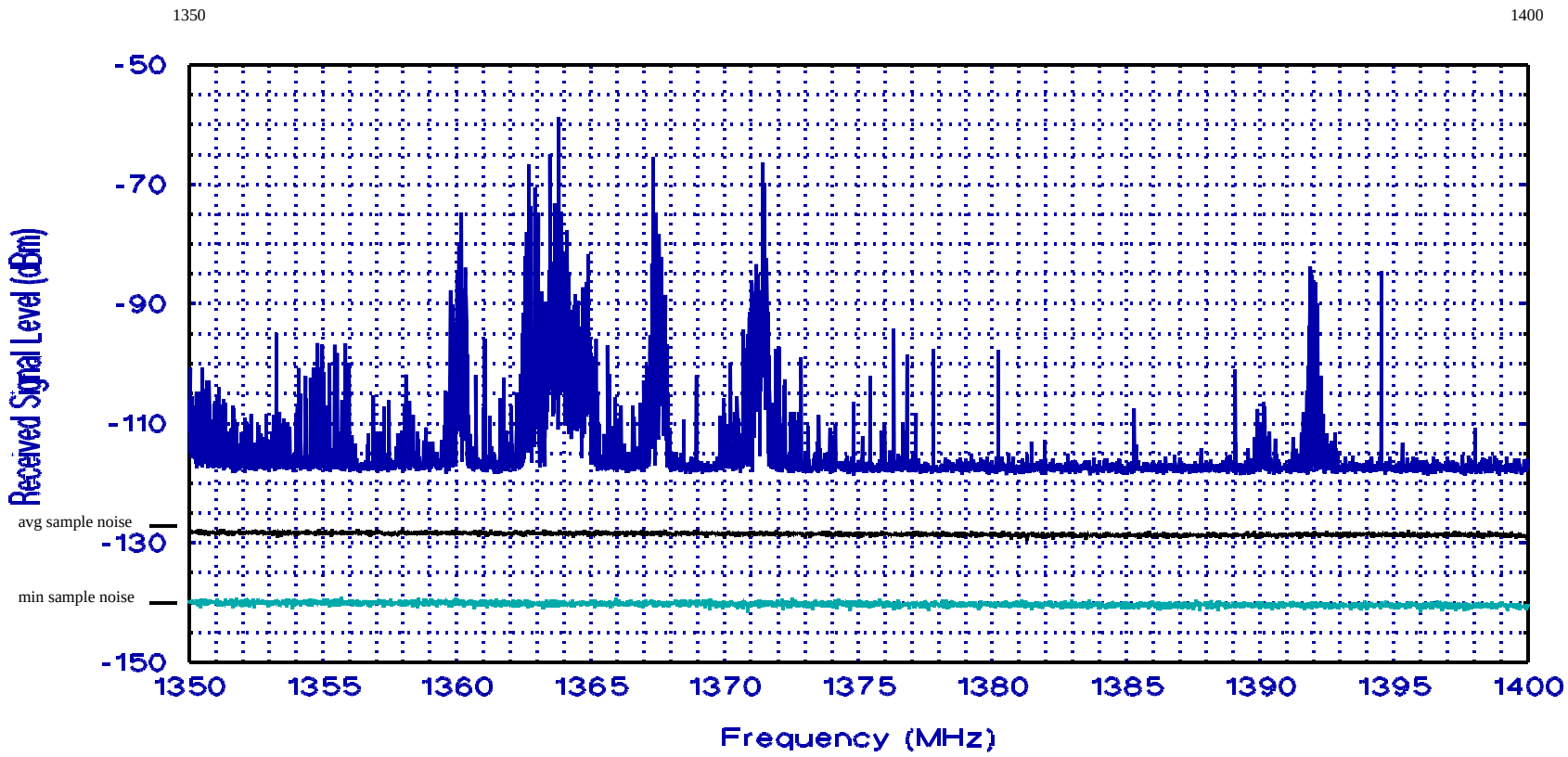
1215 1240 1300 1350 1400



1. RADIONAVIGATION-SATELLITE (space-to-Earth).
2. 1227.6 MHz: Global Positioning System (GPS).
3. High-power long-range surveillance radars including FAA Air-Route Surveillance Radar (ARSR).
4. Tethered balloon mounted radar for drug interdiction.
5. Amateur television. Amateur weak signal modes and other modes. Amateur satellite (Earth-to-space).
6. 1381.05 MHz: GPS data relay.

Figure 21. NTIA spectrum survey graph summarizing 28 scans across the 1215-1400 MHz range (System-2, band event 06, stepped algorithm, +peak detector, 1000-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	FIXED, MOBILE, RADIOLOCATION, 1.
NON-GOVERNMENT ALLOCATIONS:	1.
GENERAL UTILIZATION:	Military radiolocation, fixed and mobile links, GPS, aeronautical radionavigation, 2, 3.

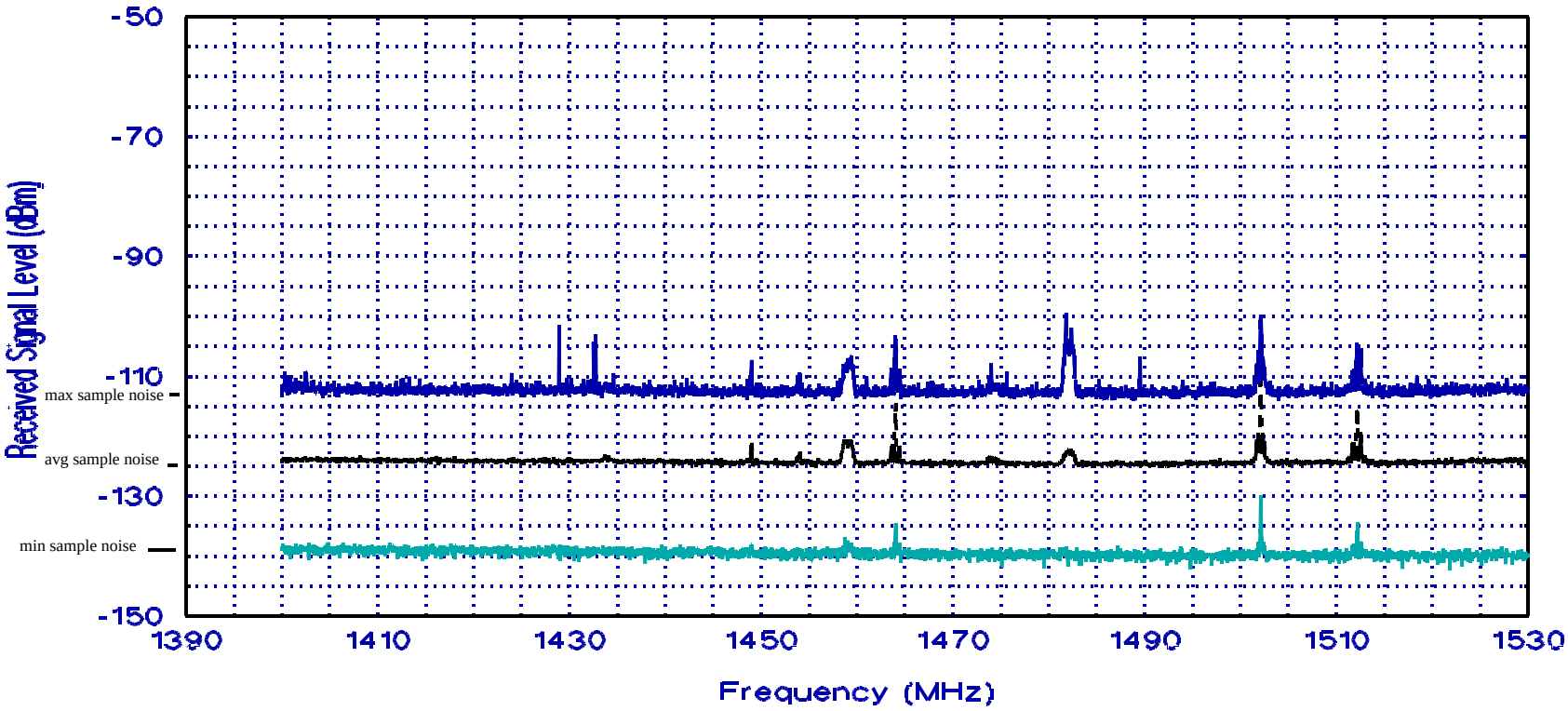


1. 1350-1370 MHz: AERONAUTICAL RADIONAVIGATION (allocation for U.S. and Canada only).
2. Military radiolocation applications are primarily high-power long-range surveillance radars.
3. 1369.05-1393.05 MHz: Fixed and mobile satellite services (space-to-Earth) for the relay of nuclear burst data. GPS operates at 1381.05 MHz to relay data detected by orbiting satellites.

Figure 22. NTIA spectrum survey graph summarizing 4,900 sweeps across the 1350-1400 MHz range (System-2, band event 07, swept/m3 algorithm, sample detector, 10-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	RADIO ASTRONOMY, 1.	2.	3.	MOBILE (Aeronautical telemetering).
NON-GOVERNMENT ALLOCATIONS:	RADIO ASTRONOMY, 1.	4.	5.	MOBILE (Aeronautical telemetering).
GENERAL UTILIZATION:	Passive.			Aeronautical telemetry and telecommand.

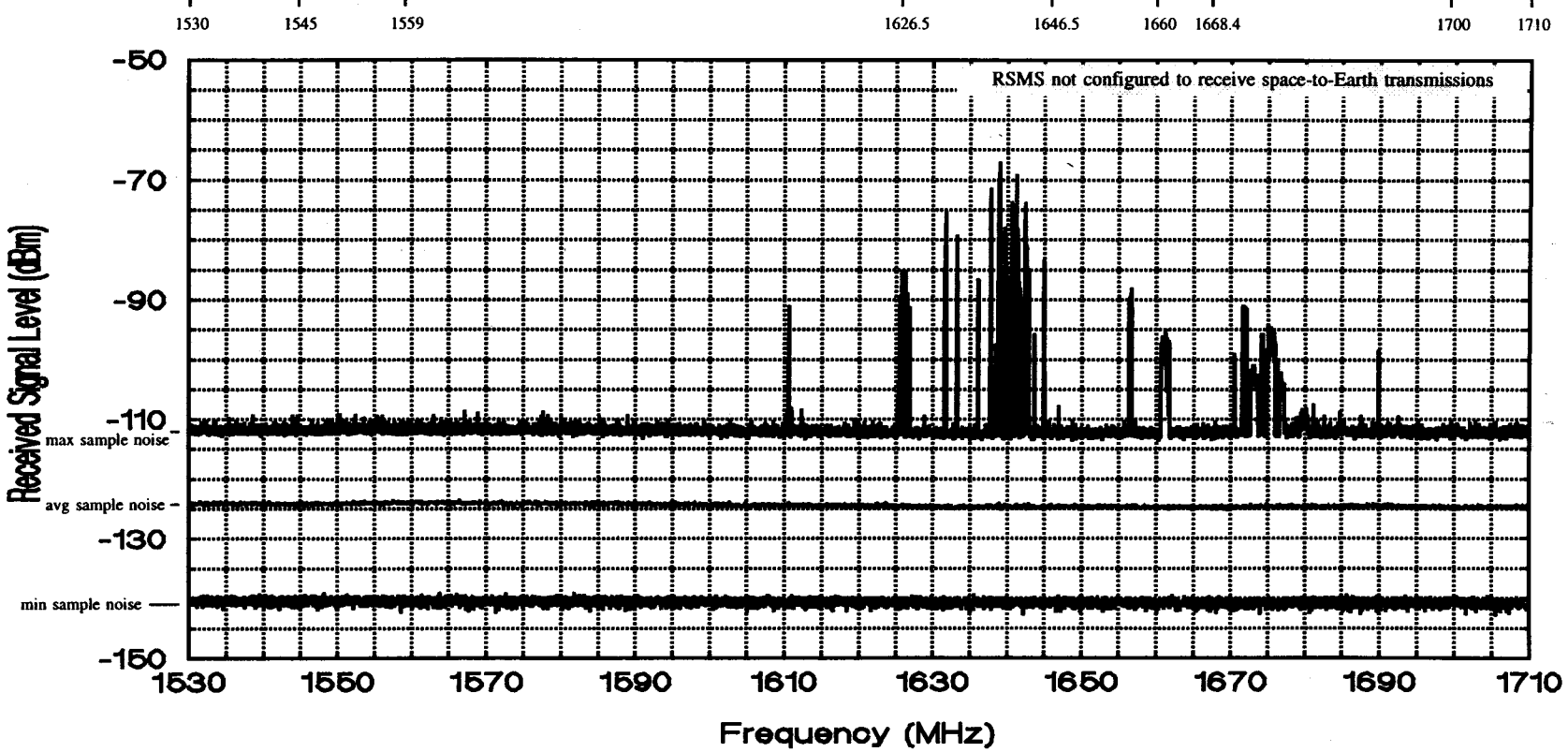
1400 1427-1429 1435 1530



1. EARTH EXPLORATION-SATELLITE (Passive), SPACE RESEARCH (Passive).
2. FIXED, MOBILE except aeronautical mobile, SPACE OPERATION (Earth-to-space).
3. FIXED, MOBILE.
4. SPACE OPERATION (Earth-to-space), Land Mobile (Telemetering and telecommand), Fixed (Telemetering).
5 Land Mobile (Telemetering and telecommand), Fixed (telemetering).

Figure 23. NTIA spectrum survey graph summarizing 9,600 sweeps across the 1400-1530 MHz range (System-2, band event 08, swept/m3 algorithm, sample detector, 30-kHz bandwidth) at San Diego, CA, 1995.

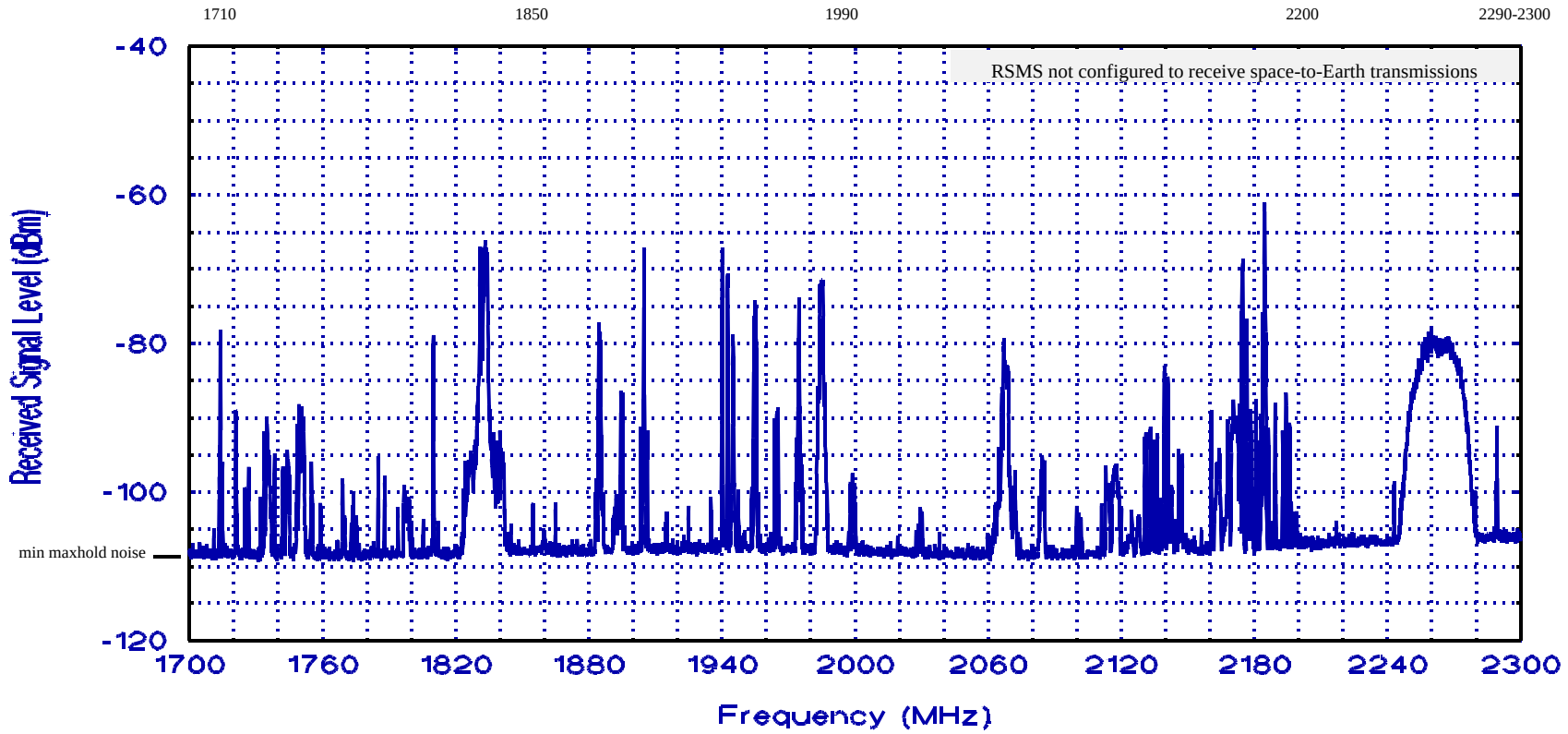
GOVERNMENT ALLOCATIONS:	1.	2.	AERONAUTICAL RADIONAVIGATION, RADIONAVIGATION-SATELLITE (space-to-Earth, 1559-1610 MHz).	3.	4.	5.	METEOROLOGICAL AIDS, (Radiosonde), 6.	FIXED, 7.
NON-GOVERNMENT ALLOCATIONS:	1.	2.	AERONAUTICAL RADIONAVIGATION, RADIONAVIGATION-SATELLITE (space-to-Earth, 1559-1610 MHz).	3.	4.	5.	METEOROLOGICAL AIDS, (Radiosonde), 6.	7, Fixed
GENERAL UTILIZATION:	INMARSAT, SARSAT.	AMS(R)S.	1559-1610 MHz: GPS, GLONASS. 1610-1626.5 MHz: Airborne aids to air navigation, only.	INMARSAT.	AMS(R)S.		Radiosondes and satellite imagery.	8.



1. 1530-1544 MHz: MARITIME MOBILE-SATELLITE (space-to-Earth). 1530-1535 MHz: Mobile (Aeronautical telemetering). 1544-1545 MHz: MOBILE-SATELLITE (space-to-Earth).
2. AERONAUTICAL MOBILE-SATELLITE (space-to-Earth). 1545-1549.5 MHz: Mobile-Satellite (space-to-Earth). 1549.5-1558.5 MHz: MOBILE-SATELLITE (space-to-Earth).
3. 1626.5-1645.5 MHz: MARITIME MOBILE-SATELLITE (Earth-to-space). 1645.5-1646.5 MHz: MOBILE-SATELLITE (Earth-to-space, distress and safety only).
4. AERONAUTICAL MOBILE-SATELLITE (Earth-to-space). 1646.5-1651 MHz: Mobile-Satellite (Earth-to-space). 1651-1660 MHz: MOBILE-SATELLITE (Earth-to-space).
5. RADIO ASTRONOMY. 1660-1660.5 MHz: AERONAUTICAL MOBILE-SATELLITE (Earth-to space). 1660.5-1668.4 MHz: SPACE RESEARCH (Passive).
6. 1668.4-1670 MHz: RADIO ASTRONOMY. 1670-1700 MHz: METEOROLOGICAL-SATELLITE (space-to-Earth).
7. METEOROLOGICAL-SATELLITE (space-to-Earth).
8. GOES, TIROS-N.

Figure 24. NTIA spectrum survey graph summarizing 35,000 sweeps across the 1530-1710 MHz range (System-2, band event 09, swept/m3 algorithm, sample detector, 30-kHz bandwidth) at San Diego, CA, 1995.

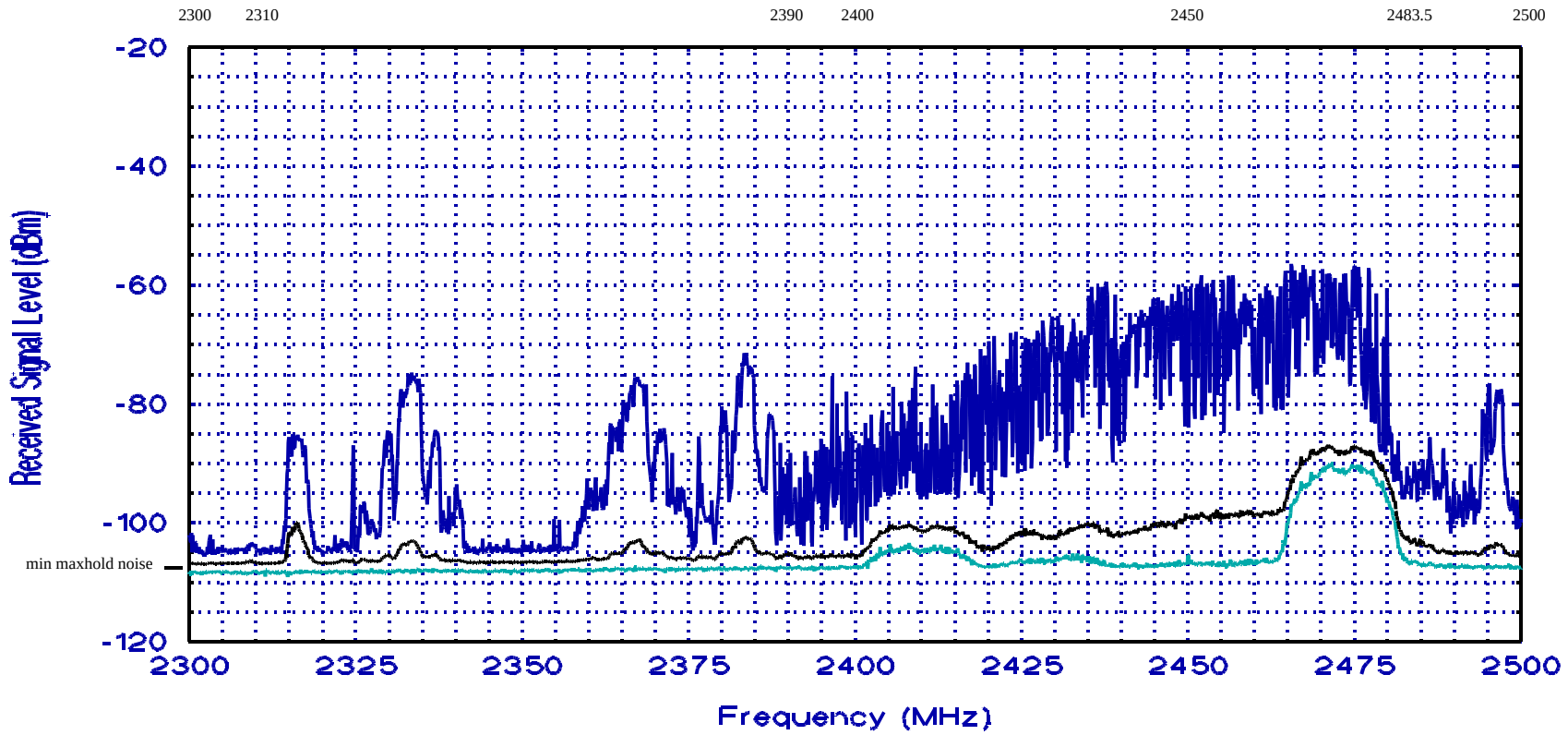
GOVERNMENT ALLOCATIONS:	FIXED, MOBILE.			FIXED (LOS only), MOBILE (LOS only), 3.	5.
NON-GOVERNMENT ALLOCATIONS:		FIXED.	MOBILE, Fixed.		6.
GENERAL UTILIZATION:	LOS fixed links, telemetry, telecommand, 1.	Private fixed microwave. Future PCS.	Auxiliary broadcasting, domestic public fixed, cable TV, control and repeater links, point to multipoint video, cellular, 2.	TDRSS, SGLS, 4.	7.



1. Predominantly federal medium-capacity line of sight (LOS) fixed service band.
2. 1990-2110 MHz: Electronic news gathering (ENG). GOES uplink, NASA's global ground network and TDRSS (2025-2110 MHz). 2110-2200 MHz: NASA space and Earth to space command links support Pioneers, Voyagers, MAGELLAN, GALILEO, and ULYSSES (2110-2120 MHz). Paired fixed links (2110-2130 MHz with 2160-2180 MHz; 2130-2150 MHz with 2180-2200 MHz). Point-to-point and point to multipoint links (2150-2160 MHz).
3. SPACE RESEARCH (space-to-Earth) (space-to-space), SPACE OPERATION (space-to-Earth) (Earth-to-space), EARTH EXPLORATION-SATELLITE space-to-Earth)(space-to-space).
4. Space telemetry, telecommand and control systems. Fixed microwave.
5. FIXED, MOBILE except aeronautical mobile, SPACE RESEARCH (space-to-Earth) (Deep Space only).
6. SPACE RESEARCH (space-to-Earth) (Deep Space only).
7. NASA deep space network space-to-Earth telemetry. Radio astronomy observations.

Figure 25. NTIA spectrum survey azimuth-scan graph of the 1710-2300 MHz range (System-2, band event 10, swept algorithm, maximum-hold detector, 100-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	1.	RADIOLOCATION, MOBILE, Fixed.	RADIOLOCATION, 5.				
NON-GOVERNMENT ALLOCATIONS:	2.	MOBILE.	6.	Amateur.	FIXED, MOBILE, Radiolocation.	8.	
GENERAL UTILIZATION:	3.	Telemetry, telemetry communications, aeronautical telemetry, 4.		Amateur Satellite (space-to-Earth). Amateur mixed modes, 7.	7.	7, 9.	

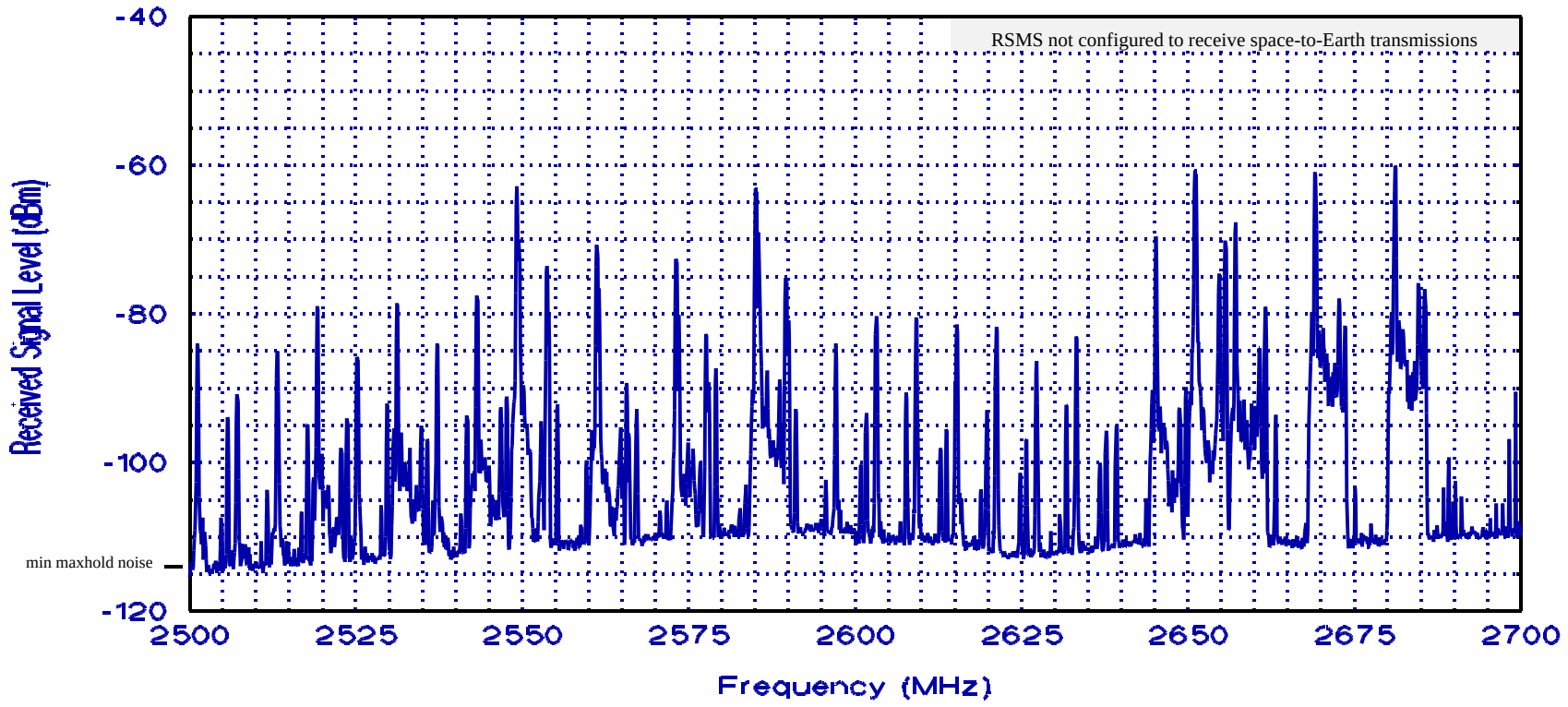


1. RADIOLOCATION, Fixed, Mobile.
2. Amateur.
3. Amateur weak signal modes and other modes.
4. AF High-power long-range surveillance radar and air traffic control radar. Venus Radar Mapper (VRM) synthetic aperture radar.
5. No Government allocations in this band after August 1995.
6. AMATEUR.
7. 2400-2500 MHz: Is also used for industrial scientific and medical (ISM) applications including microwave ovens.
8. RADIODETERMINATION-SATELLITE (space-to-Earth).
9. Satellite downlinks and multichannel fixed and portable video transmission by TV broadcasters.

Figure 26. NTIA spectrum survey graph summarizing 28,800 sweeps across the 2300-2500 MHz range (System-2, band event 11, swept algorithm, maximum-hold detector, 100-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:		3.	4.	
NON-GOVERNMENT ALLOCATIONS:	BROADCASTING-SATELLITE, FIXED, 1.	FIXED, BROADCASTING-SATELLITE, 1, 3.	4.	
GENERAL UTILIZATION:	Auxiliary broadcasting, pay television distribution, private video teleconferences, educational television (ITSF), 2.	Private fixed microwave, 2.		

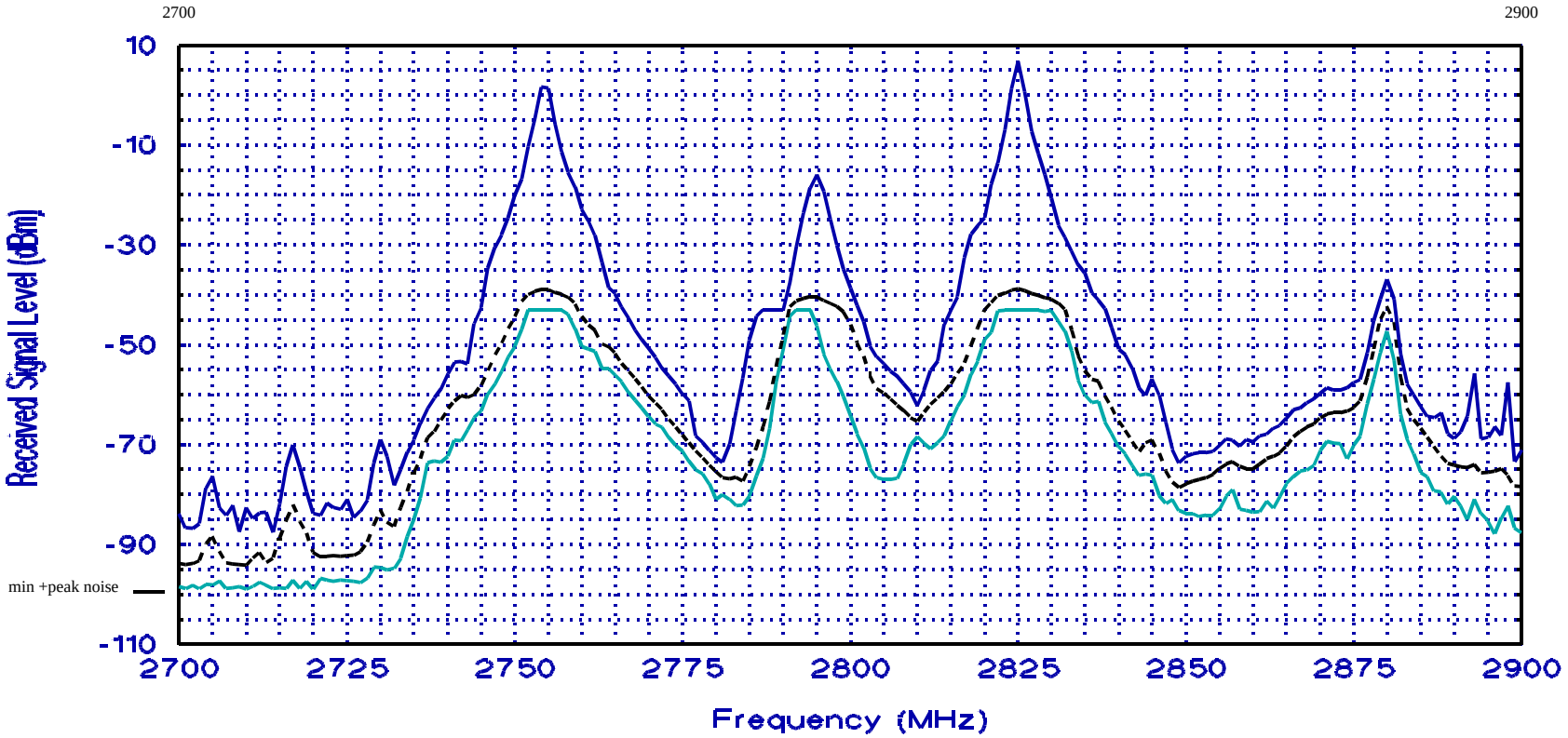
2500 2655 2690 2700



1. Broadcasting-satellite service is limited to community reception of educational and public service television programming.
2. 2500-2686 MHz: Omnidirectional transmission of multipoint MDS that can be contained within 6 MHz channel bandwidths.
3. Earth Exploration-Satellite (Passive), Radio Astronomy, Space Research (Passive).
4. EARTH EXPLORATION-SATELLITE (Passive), RADIO ASTRONOMY, SPACE RESEARCH (Passive).

Figure 27. NTIA spectrum survey azimuth-scan graph of the 2500-2700 MHz range (System-2, band event 12, swept algorithm, maximum-hold detector, 10-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	AERONAUTICAL RADIONAVIGATION, METEOROLOGICAL AIDS, Radiolocation, 1, 2.
NON-GOVERNMENT ALLOCATIONS:	
GENERAL UTILIZATION:	Airport surveillance radars (ASRs), military ground control approach radars (GCAs), NWS weather radars (NEXRAD, etc.), long-range surveillance radars and air traffic control radars.

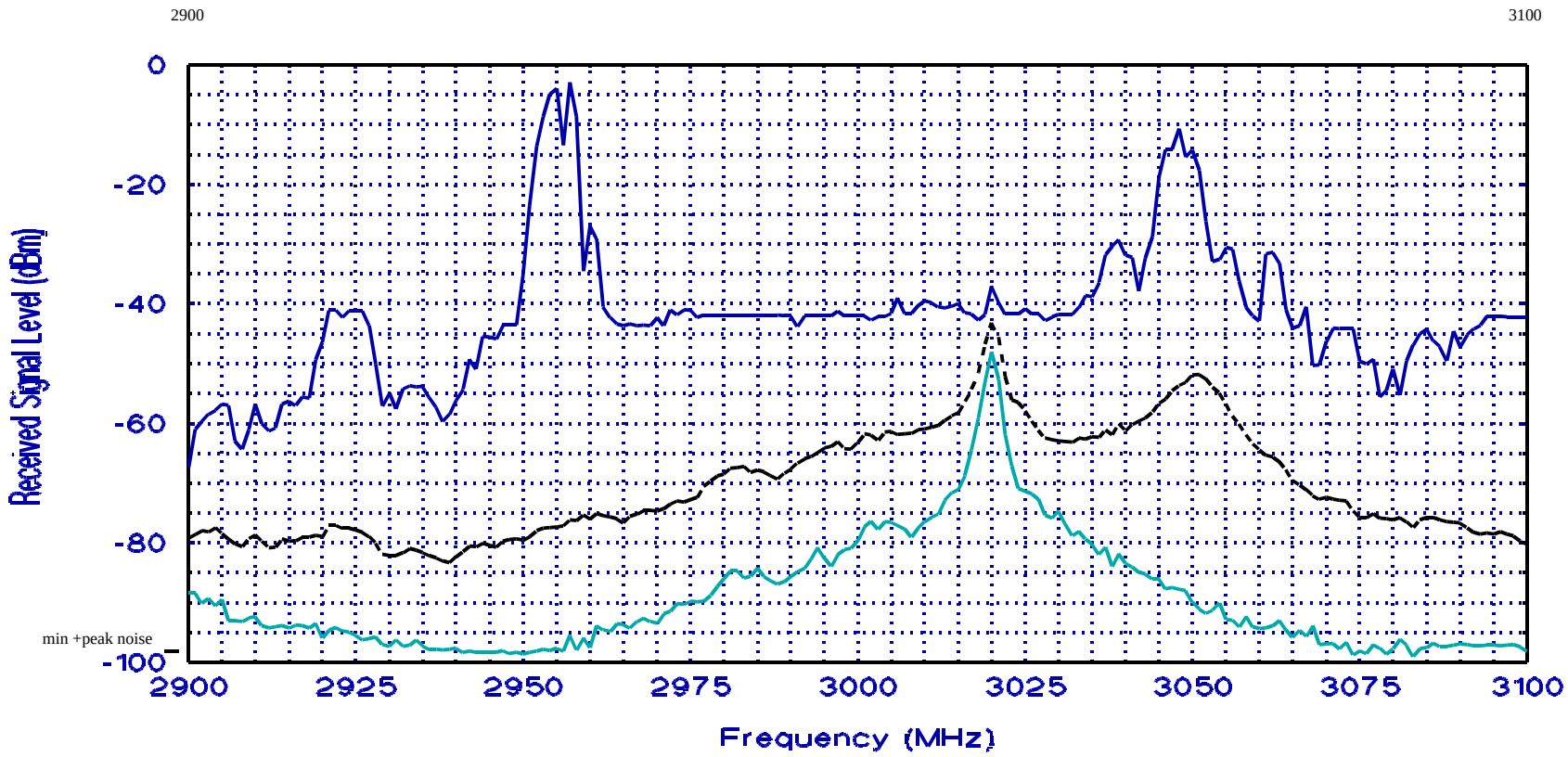


1. The aeronautical radionavigation service is restricted to ground-based radars and associated airborne transponders that transmit only in this band when actuated by these radars.

2. The secondary radiolocation service is limited to the military and must be fully coordinated with the primary services.

Figure 28. NTIA spectrum survey graph summarizing 28 scans across the 2700-2900 MHz range (System-2, band event 13, stepped algorithm, +peak detector, 1000-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	MARITIME RADIONAVIGATION, Radiolocation, 1, 2.
NON-GOVERNMENT ALLOCATIONS:	MARITIME RADIONAVIGATION, Radiolocation, 1, 2.
GENERAL UTILIZATION:	Maritime radars and radar beacons (racons), military high-power 3-D long-range surveillance radars and air traffic control radars.

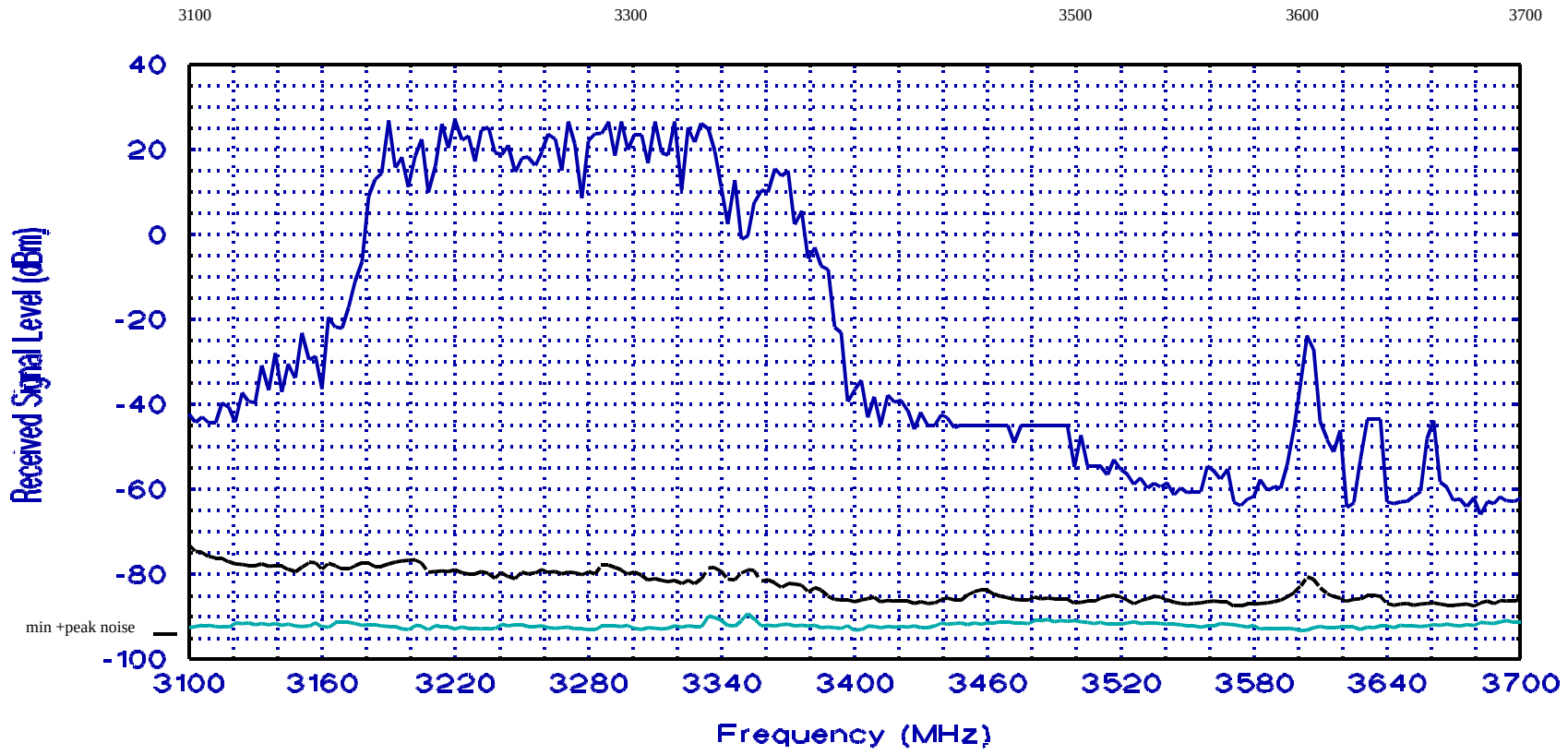


1. Radiolocation assignments are primarily for the military; however, other agency use is permitted for experimentation, research, and survey operations, if no harmful interference occurs.

2. 2900-3000 MHz: Also, allocated for next generation weather radar (NEXRAD) systems.

Figure 29. NTIA spectrum survey graph summarizing 48 scans across the 2900-3100 MHz range (System-2, band event 14, stepped algorithm, +peak detector, 1000-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	RADIOLOCATION.	RADIOLOCATION.	RADIOLOCATION, 1.	RADIOLOCATION, 1.	
NON-GOVERNMENT ALLOCATIONS:	Radiolocation.	Amateur, Radiolocation.	Radiolocation.	FIXED-SATELLITE (space-to-Earth), 2.	
GENERAL UTILIZATION:	3.	3.	3.	INMARSAT, INTELSAT.	



1. AERONAUTICAL RADIONAVIGATION (Ground-based).
2. Radiolocation.
3. Primarily, military airborne, land-based, and shipborne defense radars.

Figure 30. NTIA spectrum survey graph summarizing 46 scans across the 3100-3700 MHz range (System-2, band event 15, stepped algorithm, +peak detector, 3000-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	
NON-GOVERNMENT ALLOCATIONS:	FIXED, FIXED-SATELLITE (space-to-Earth).
GENERAL UTILIZATION:	Domestic public fixed, satellite communications.

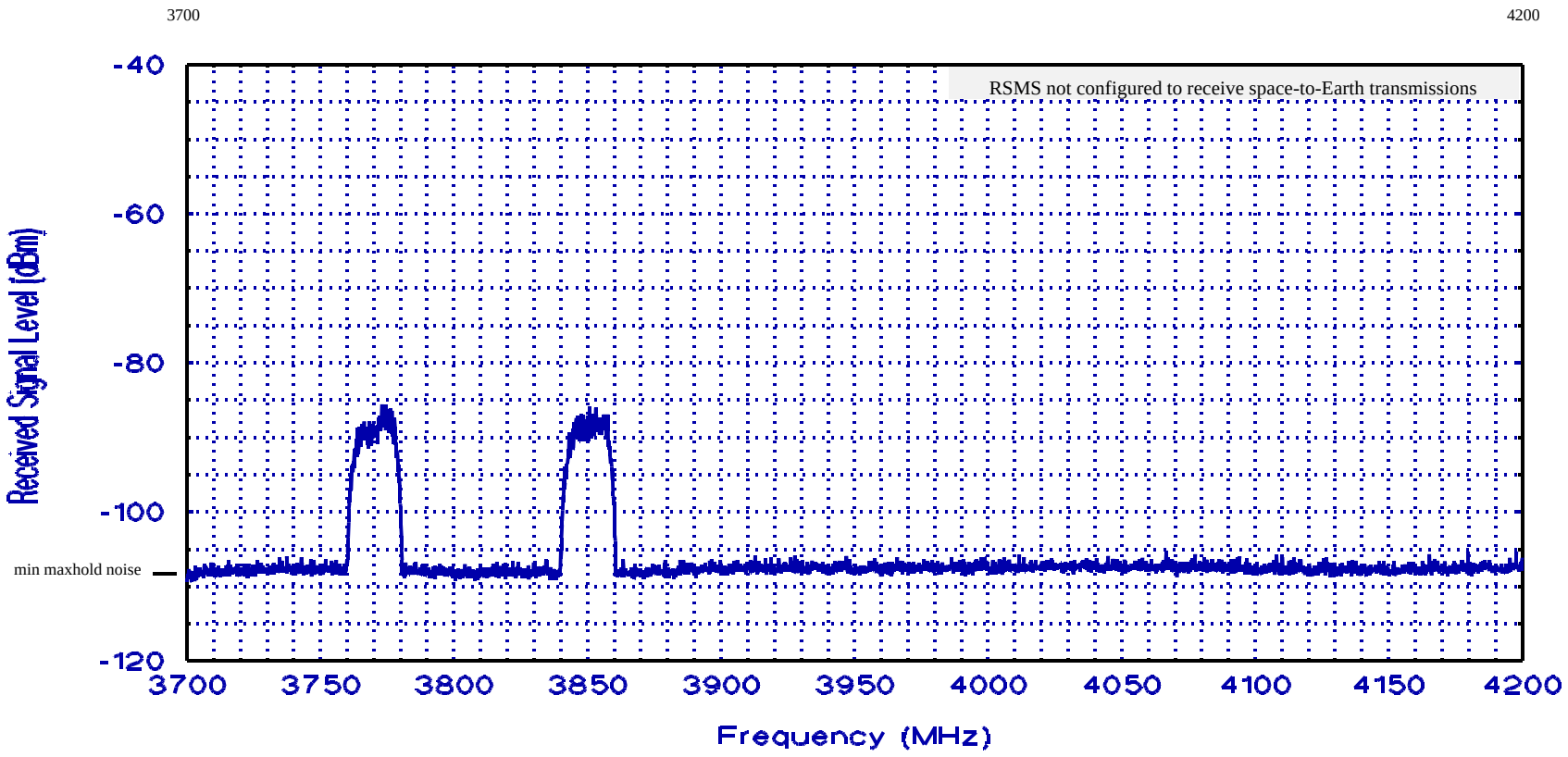
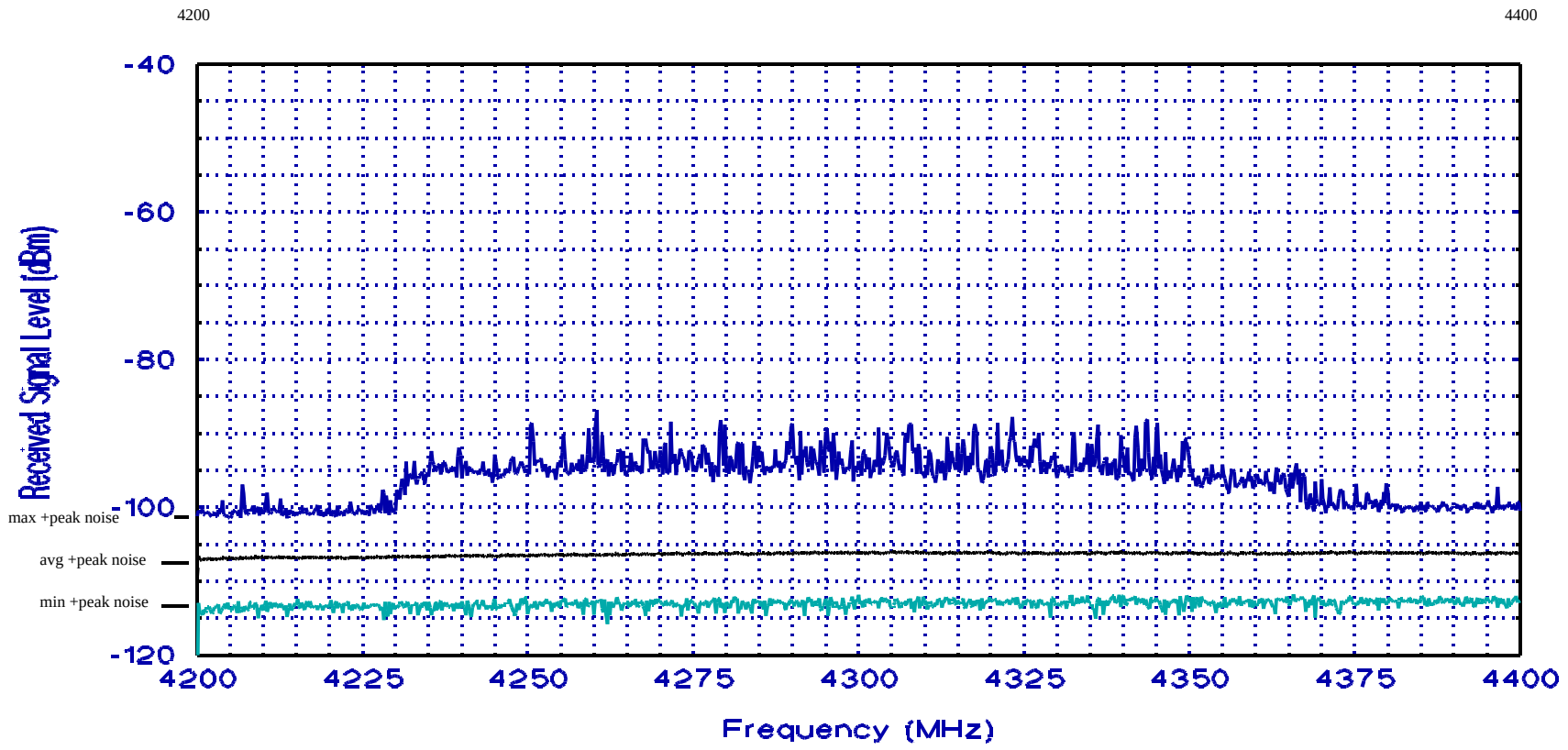


Figure 31. NTIA spectrum survey azimuth-scan graph of the 3700-4200 MHz range (System-2, band event 16, swept algorithm, maximum-hold detector, 100-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	AERONAUTICAL RADIONAVIGATION, 1.
NON-GOVERNMENT ALLOCATIONS:	AERONAUTICAL RADIONAVIGATION, 1.
GENERAL UTILIZATION:	Airborne radio altimeters.

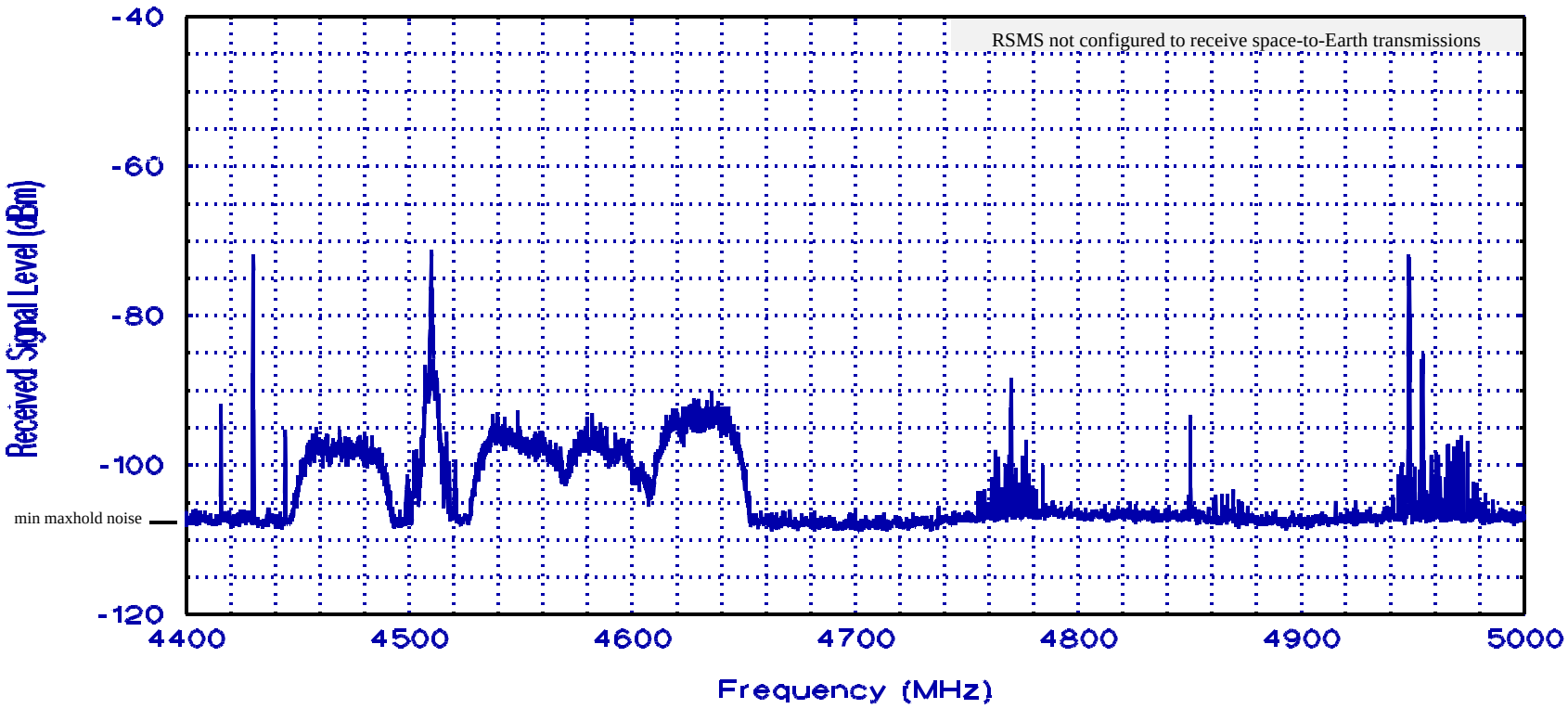


1. 4202 ±12 MHz: Standard frequency and time satellite service (space-to-Earth), permitted.

Figure 32. NTIA spectrum survey graph summarizing 32,500 sweeps across the 4200-4400 MHz range (System-2, band event 17, swept/m3 algorithm, +peak detector, 300-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	FIXED, MOBILE, 1.		2.
NON-GOVERNMENT ALLOCATIONS:		FIXED-SATELLITE (space-to-Earth).	2.
GENERAL UTILIZATION:	Narrowband and wideband uplinks and downlinks.		

4400 4500 4800 4990-5000



1. 4660-4685 MHz: No Government allocation after August 1994.

2. RADIO ASTRONOMY, Space Research (Passive).

Figure 33. NTIA spectrum survey azimuth-scan graph of the 4400-5000 MHz range (System-2, band event 18, swept algorithm, maximum-hold detector, 100-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	AERONAUTICAL RADIONAVIGATION.
NON-GOVERNMENT ALLOCATIONS:	AERONAUTICAL RADIONAVIGATION.
GENERAL UTILIZATION:	Microwave landing systems.

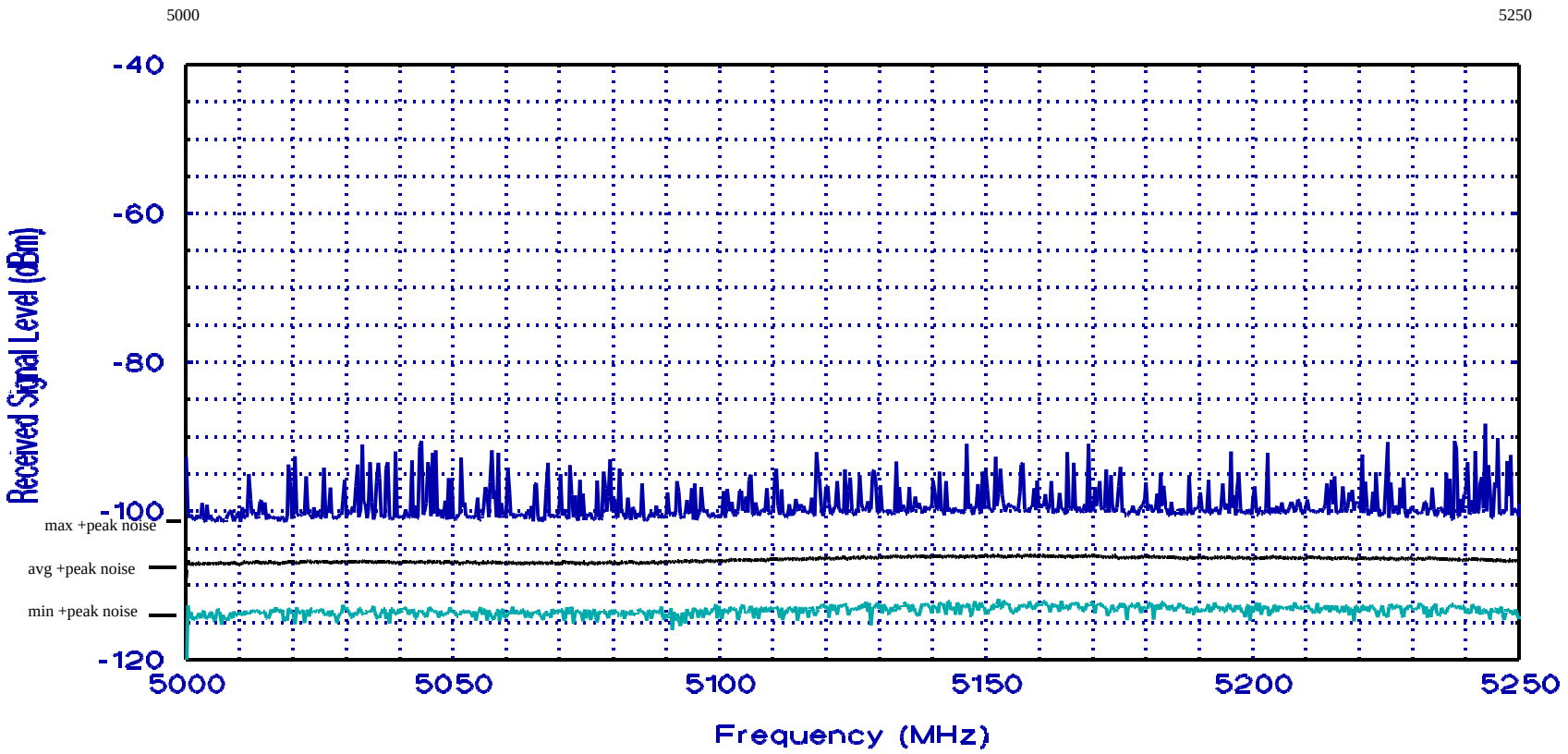
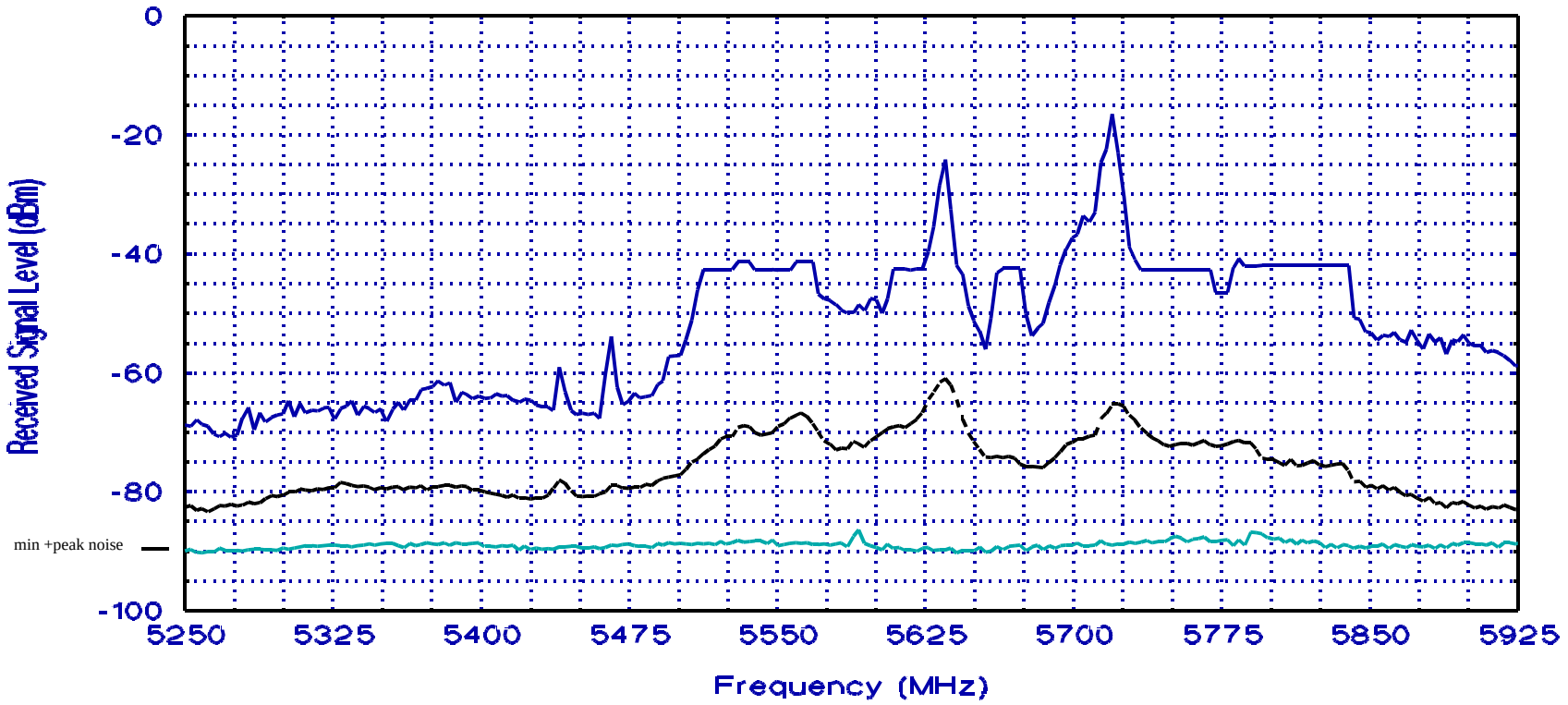


Figure 34. NTIA spectrum survey graph summarizing 32,000 sweeps across the 5000-5250 MHz range (System-2, band event 19, swept/m3 algorithm, +peak detector, 300-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	RADIOLOCATION.	AERONAUTICAL RADIONAVIGATION, 1.	3.	MARITIME RADIONAVIGATION, Radiolocation.	4.	RADIOLOCATION.	
NON-GOVERNMENT ALLOCATIONS:	Radiolocation.	AERONAUTICAL RADIONAVIGATION, 2.	3.	MARITIME RADIONAVIGATION, Radiolocation.	4.	Amateur. 6.	
GENERAL UTILIZATION:				Weather radars.	5.	Military radars, 7. 7.	

5250 5350 5460-5470 5600 5650 5850 5925

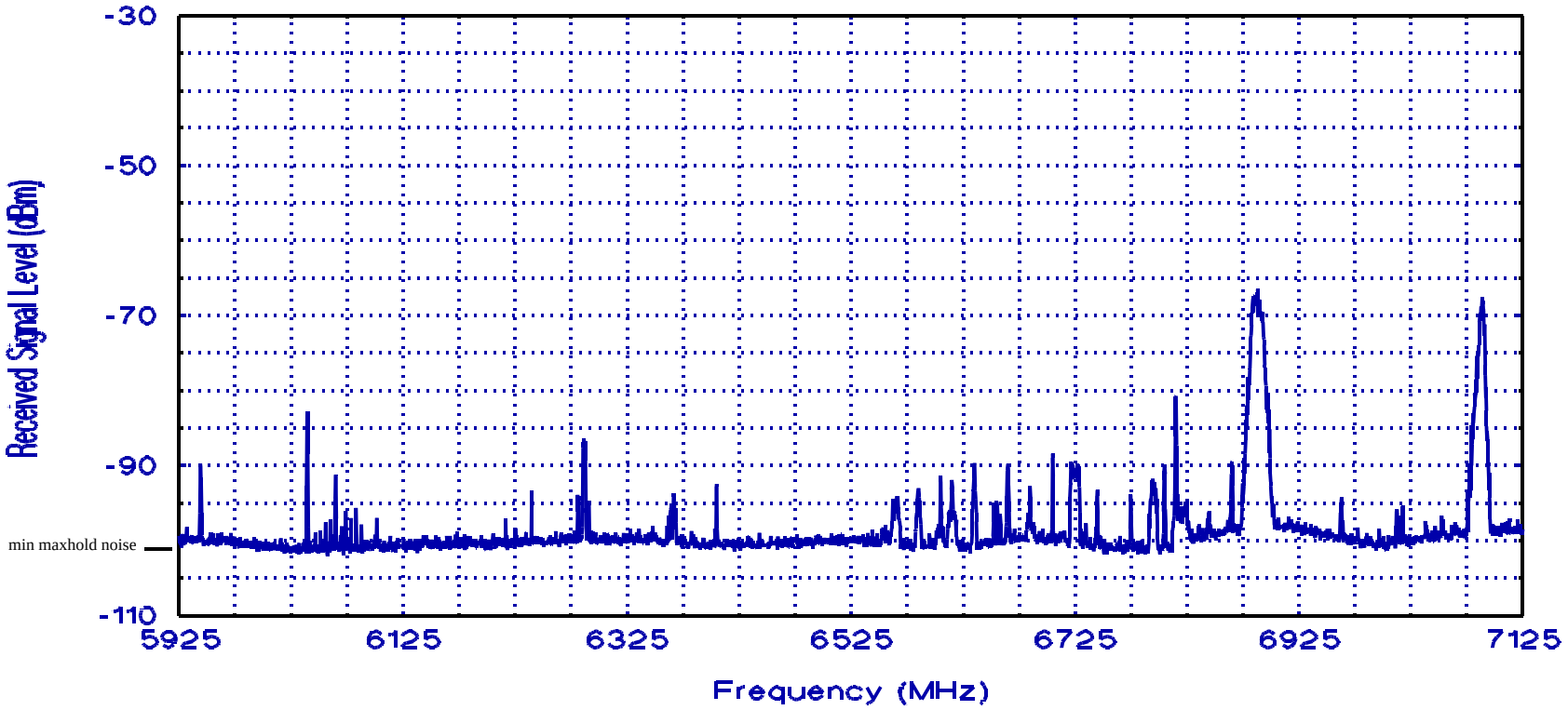


1. RADIOLOCATION.
2. Radiolocation.
3. RADIONAVIGATION, Radiolocation.
4. MARITIME RADIONAVIGATION, METEOROLOGICAL AIDS, Radiolocation.
5. Government weather radars, e.g., Terminal Doppler Weather Radar (TDWR).
6. FIXED-SATELLITE (Earth-to-space), Amateur.
7. 5725-5875 MHz: Industrial, scientific, and medical (ISM).

Figure 35. NTIA spectrum survey graph summarizing 22 scans across the 5250-5925 MHz range (System-2, band event 20, stepped algorithm, +peak detector, 3000-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:					
NON-GOVERNMENT ALLOCATIONS:	FIXED, FIXED-SATELLITE (Earth-to-space).	1.	FIXED, FIXED-SATELLITE (Earth-to-space).	FIXED-SATELLITE (Earth-to-space), 2.	2.
GENERAL UTILIZATION:	Common carrier fixed links.		Common carrier fixed links.	Common carrier fixed links.	

5925 6425 6525 6875 7075 7125

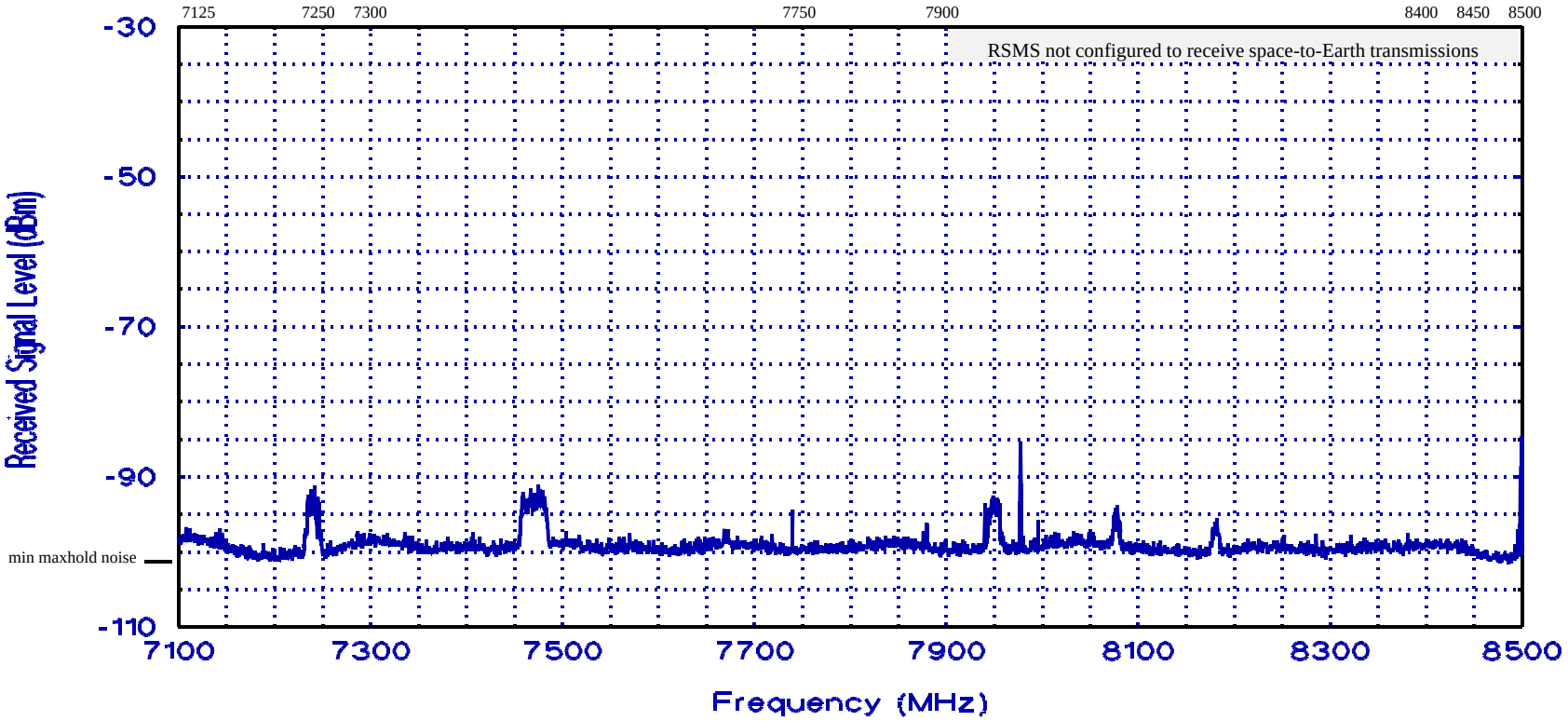


1. FIXED-SATELLITE (Earth-to-space), MOBILE.

2. FIXED, MOBILE.

Figure 36. NTIA spectrum survey azimuth-scan graph of the 5925-7125 MHz range (System-2, band event 21, swept algorithm, maximum-hold detector, 300-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	FIXED, 1.	3.	FIXED, FIXED-SATELLITE (space-to-Earth), Mobile-Satellite (space-to-Earth), 4.	FIXED.	FIXED-SATELLITE (Earth-to-space), 5, 6, 7.	FIXED, 8, 9.	
NON-GOVERNMENT ALLOCATIONS:							8.
GENERAL UTILIZATION:	2.	2.	2.	2.	2.	2.	2.

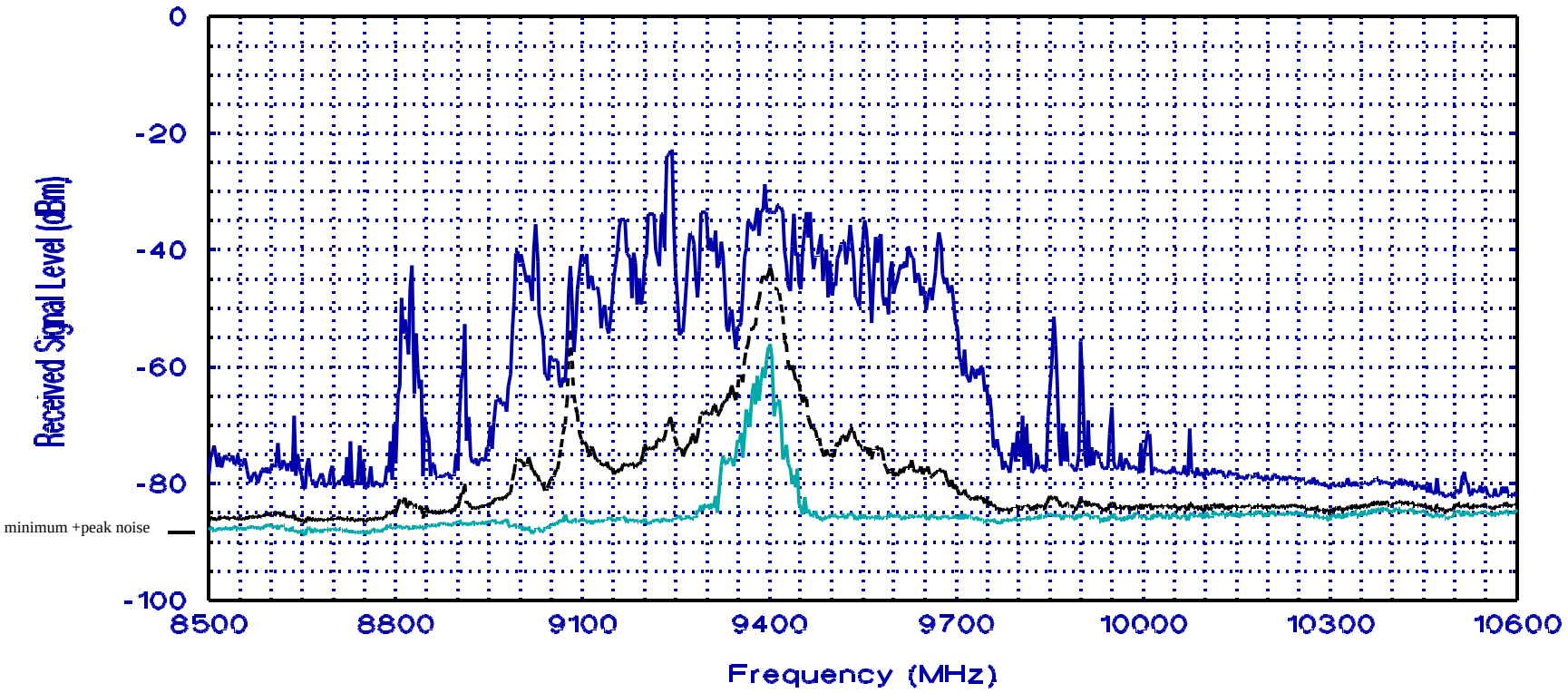


1. 7190-7235 MHz: SPACE RESEARCH (Earth-to-space).
2. Point-to-point microwave voice/data links, defense satellite communications systems (DSCS).
3. FIXED-SATELLITE (space-to-Earth), MOBILE-SATELLITE (space-to-Earth), Fixed.
4. 7450-7550 MHz: METEOROLOGICAL-SATELLITE (space-to-Earth).
5. 7900-8025 MHz: MOBILE-SATELLITE (Earth-to-space), fixed.
6. 8025-8400 MHz: EARTH EXPLORATION-SATELLITE (space-to-Earth), FIXED, Mobile-Satellite (Earth-to-space) (no airborne transmissions).
7. 8175-8215 MHz: METEOROLOGICAL-SATELLITE (Earth-to-space).
8. SPACE RESEARCH (space-to-Earth) (Government: 8400-8450 MHz deep space only).
9. 8400-8450 MHz: Deep space only.

Figure 37. NTIA spectrum survey azimuth-scan graph of the 7125-8500 MHz range (System-2, band event 22, swept algorithm, maximum-hold detector, 300-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	RADIOLOCATION.	1.	2.	3.	RADIOLOCATION.			
NON-GOVERNMENT ALLOCATIONS:	Radiolocation.	1.	2.	3.	Radiolocation.	Amateur, Radiolocation.	6.	
GENERAL UTILIZATION:	Military use is primary.			4.	5.			

8500 9000 9200 9300 9500 10000 10450 10550

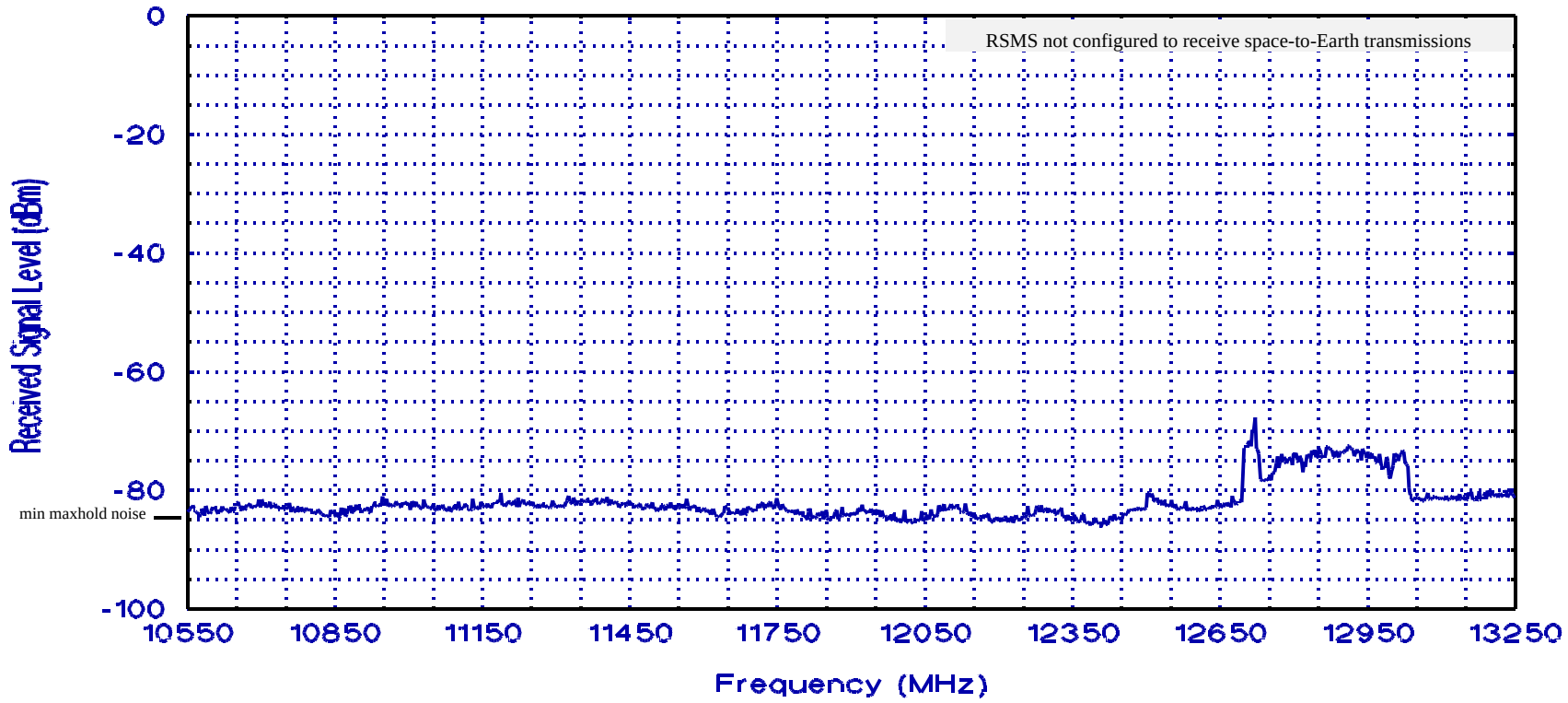


1. AERONAUTICAL RADIONAVIGATION, Radiolocation.
2. MARITIME RADIONAVIGATION, Radiolocation.
3. RADIONAVIGATION, Meteorological Aids, Radiolocation.
4. Maritime radionavigation radar, airborne weather radar, radar transponder beacons (RACONS).
5. Military airborne radar.
6. RADIOLOCATION. 10450-10500 MHz: Amateur, Amateur-Satellite.

Figure 38. NTIA spectrum survey graph summarizing 23 scans across the 8500-10550 MHz range (System-2, band event 23, stepped algorithm, +peak detector, 3000-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	1.					
NON-GOVERNMENT ALLOCATIONS:	2.	FIXED, FIXED-SATELLITE (space-to-Earth).	FIXED-SATELLITE (space-to-Earth), 3.	FIXED, BROADCASTING-SATELLITE.	FIXED, FIXED-SATELLITE (Earth-to-space), MOBILE.	
GENERAL UTILIZATION:		Common carrier point-to-point microwave links, television studio-to-transmitter links.		Direct broadcast satellite services (DBS).	Cable Relay Systems (CARS), 4.	

10550 10700 11700 12200 12700 13250

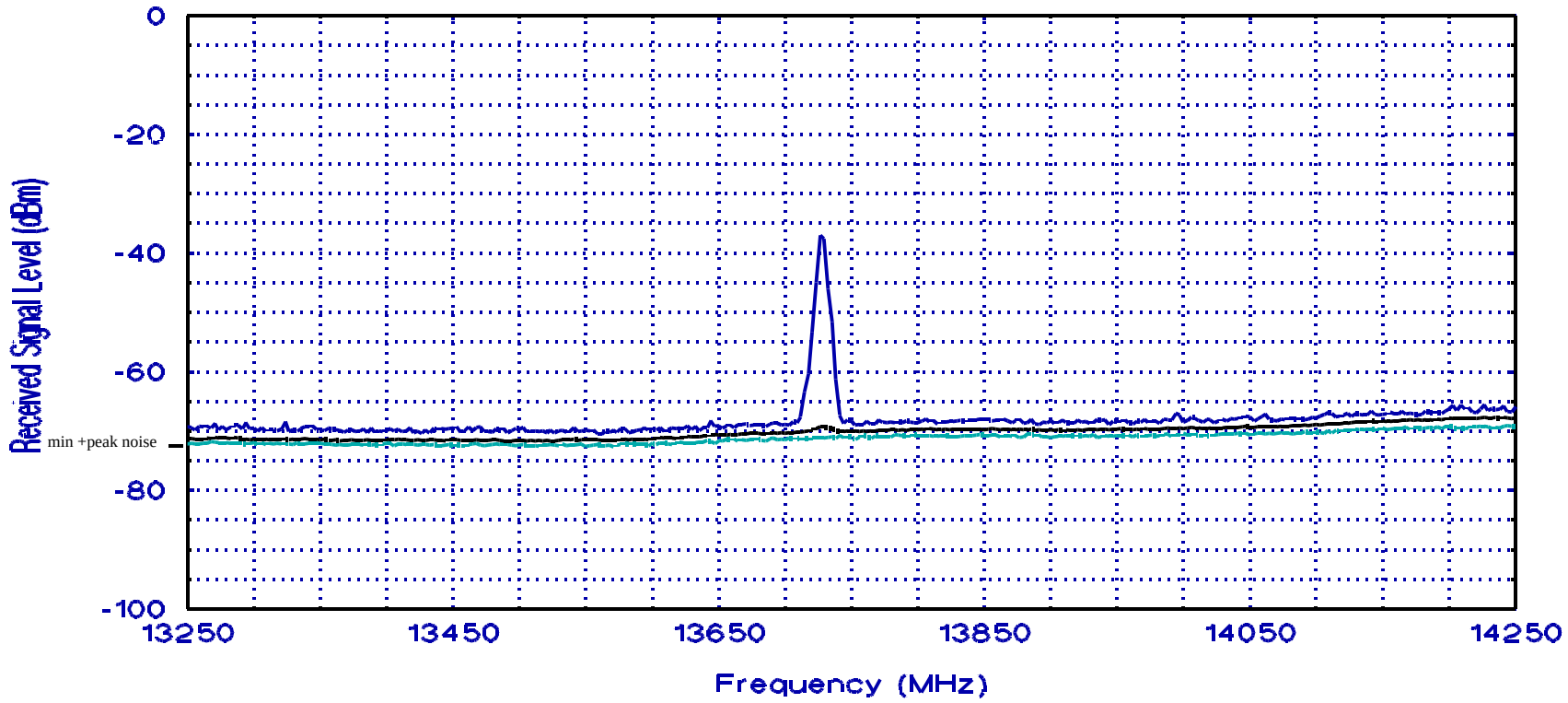


1. 10600-10700 MHz: EARTH EXPLORATION-SATELLITE (Passive), SPACE RESEARCH (Passive). 10680-10700 MHz: RADIO ASTRONOMY.
2. 10550-10680 MHz: FIXED. 10600-10700 MHz: EARTH EXPLORATION-SATELLITE (Passive), SPACE RESEARCH (Passive). 10680-10700 MHz: RADIO ASTRONOMY.
3. Mobile except aeronautical mobile.
4. Television auxiliary broadcasting (includes: SHL, STL, ENG, and ICR's).

Figure 39. NTIA spectrum survey azimuth-scan graph of the 10550-13250 MHz range (System-2, band event 24, swept algorithm, maximum-hold detector, 3000-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	AERONAUTICAL RADIONAVIGATION, 1.	RADIOLOCATION, Space Research, Standard Frequency and Time Signal-Satellite (Earth-to-space).	RADIONAVIGATION, Space Research.	
NON-GOVERNMENT ALLOCATIONS:	AERONAUTICAL RADIONAVIGATION, 1.	Radiolocation, Space Research, Standard Frequency and Time Signal-Satellite (Earth-to-space).	RADIONAVIGATION, Space Research, 2.	
GENERAL UTILIZATION:		Military airborne radars.		

13250 13400 14000 14200

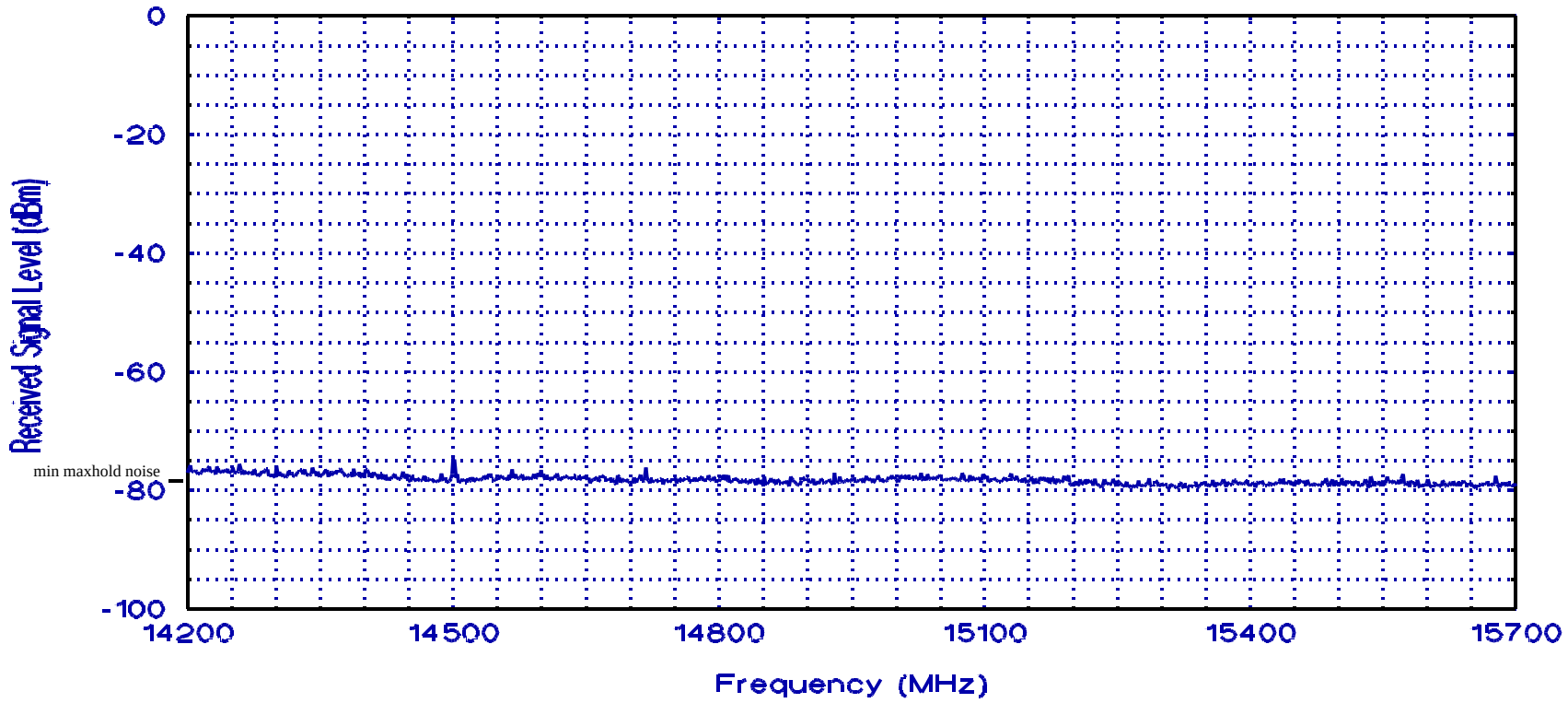


1. Space Research (Earth-to-space).

2. FIXED-SATELLITE (Earth-to-space).

Figure 40. NTIA spectrum survey graph summarizing 40 scans across the 13250-14200 MHz range (System-2, band event 25, stepped algorithm, +peak detector, 3000-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:		Fixed, Mobile.	FIXED, Mobile, Space Research.	MOBILE, Fixed, Space Research.	FIXED, Mobile, Space Research.	3.	AERONAUTICAL RADIONAVIGATION.
NON-GOVERNMENT ALLOCATIONS:	FIXED-SATELLITE (Earth-to-space).	1.				3.	AERONAUTICAL RADIONAVIGATION.
GENERAL UTILIZATION:			2.		2.		
	14200	14400	14500	14714.5	15136.5	15350-15400	15700

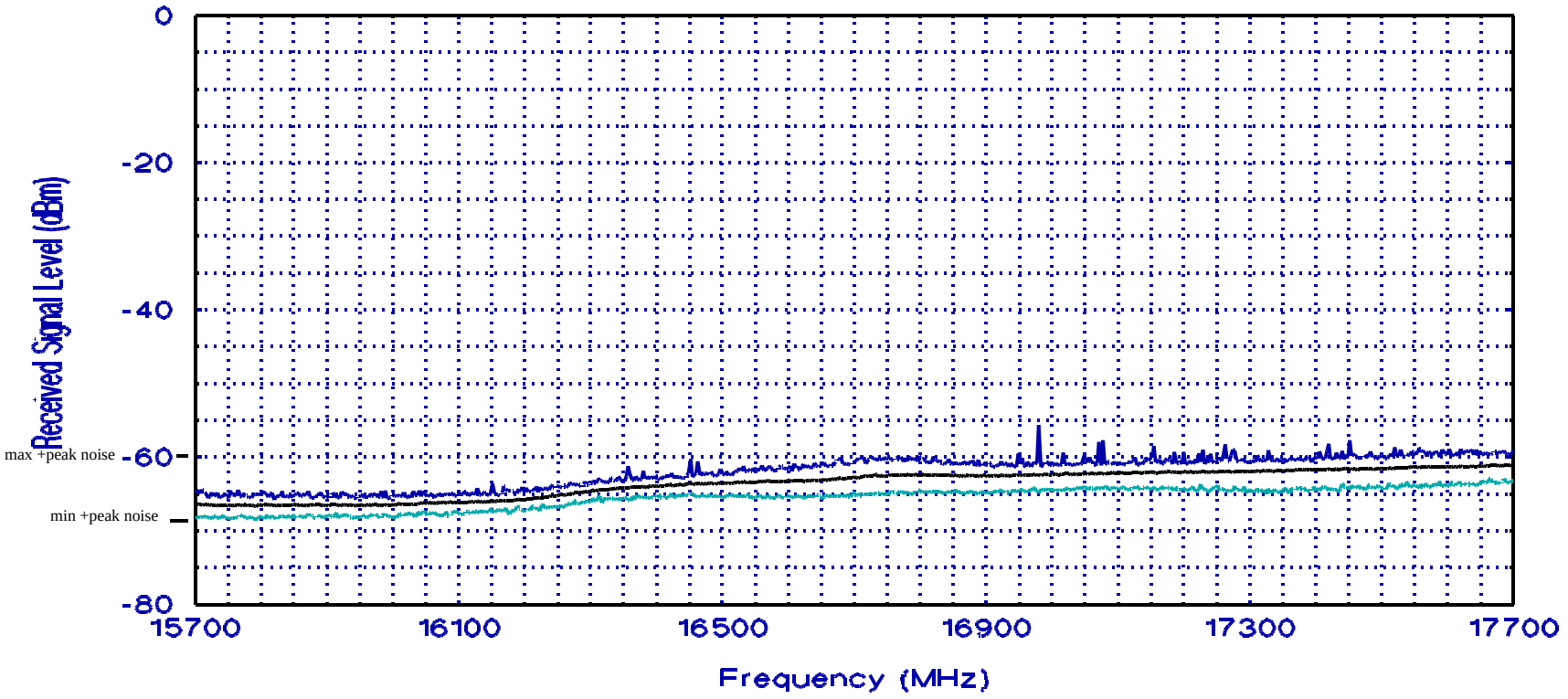


1. FIXED-SATELLITE (Earth-to-space).
2. Military communication links and microwave links. Air traffic control links, including video data.
3. EARTH EXPLORATION-SATELLITE (Passive), RADIO ASTRONOMY, SPACE RESEARCH (Passive).

Figure 41. NTIA spectrum survey azimuth-scan graph of the 14200-15700 MHz range (System-2, band event 26, swept algorithm, maximum-hold detector, 3000-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:	RADIOLOCATION.	RADIOLOCATION, Space Research (Deep Space) (Earth-to-space).	1.	3.	Radiolocation.	
NON-GOVERNMENT ALLOCATIONS:	Radiolocation.	Radiolocation.	2.	4.	FIXED-SATELLITE (Earth-to-space).	
GENERAL UTILIZATION:	Military airborne radars.	Military airborne radars.				

15700 16600 17100 17200 17300 17700

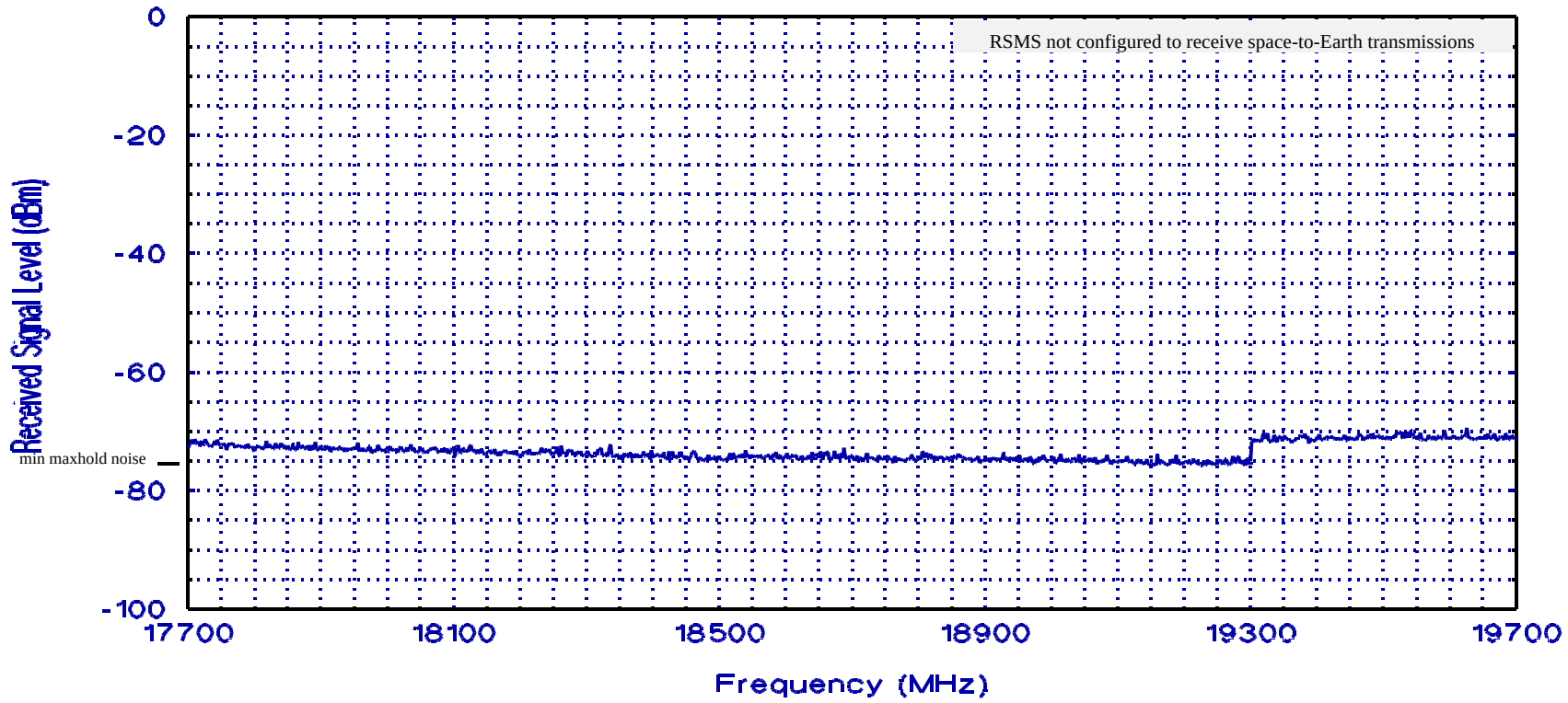


1. RADIOLOCATION.
2. Radiolocation.
3. RADIOLOCATION, Earth Exploration-Satellite (Active), Space Research (Active).
4. Earth Exploration-Satellite (Active), Radiolocation, Space Research (Active).

Figure 42. NTIA spectrum survey graph summarizing 39 scans across the 15700-17700 MHz range (System-2, band event 27, stepped algorithm, +peak detector, 3000-kHz bandwidth) at San Diego, CA, 1995.

GOVERNMENT ALLOCATIONS:		2.		
NON-GOVERNMENT ALLOCATIONS:	FIXED, MOBILE, FIXED-SATELLITE (space-to-Earth), 1.	3.	FIXED, FIXED-SATELLITE (space-to-Earth), MOBILE.	
GENERAL UTILIZATION:	General purpose point-to-point microwave band including private, common carrier, cable television relay systems (CARS), studio-to-transmitter (STL) television links, Digital Electronic Message Services (DEMS), etc.			

17700 18600 18800 19700



1. 17700-17800 MHz: FIXED-SATELLITE (Earth-to-space).
2. EARTH EXPLORATION-SATELLITE (Passive), SPACE RESEARCH (Passive).
3. FIXED, FIXED-SATELLITE (space-to-Earth), EARTH EXPLORATION-SATELLITE (Passive), MOBILE (exc. aeronaut. mobile), SPACE RESEARCH (Passive).

Figure 43. NTIA spectrum survey aximuth-scan graph of the 17700-19700 MHz range (System-2, band event 28, swept algorithm, maximum-hold detector, 3000-kHz bandwidth) at San Diego, CA, 1995.